

UNIVERSIDADE DE SÃO PAULO
FACULDADE DE ZOOTECNIA E ENGENHARIA DE ALIMENTOS

**Exercícios desenho técnico e desenho assistido
por computador**

Cursos:

Engenharia de Alimentos
Engenharia de Biosistemas

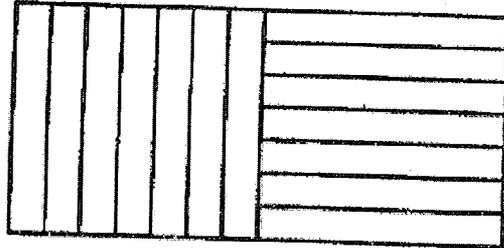
Prof. Juliano Fiorelli

CAPÍTULO 2

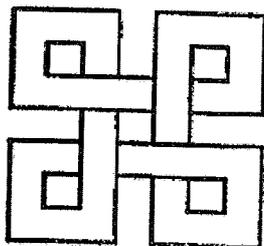
Desenho
Exercícios

Nome _____
Nº _____ Turma _____

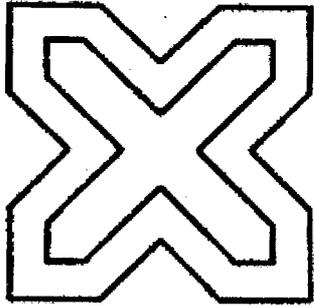
1)



2)

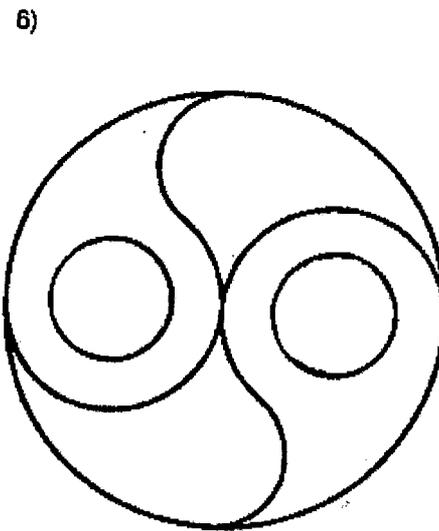
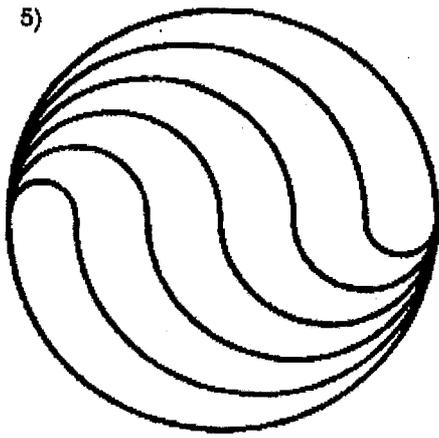


3)



4)





Desenho

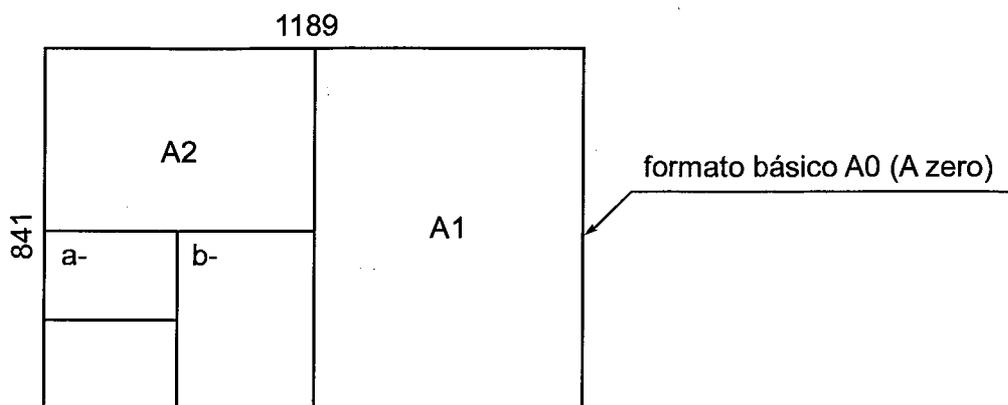
Nome _____

Exercícios

Nº _____ Turma _____

Material - Identificar materiais para desenho.

1. Complete o quadro abaixo, escrevendo os respectivos nomes nos formatos dos papéis de desenho A3 e A4.



2. Complete a tabela ao lado, escrevendo as medidas das margens dos formatos A3 e A4.

	Formato	Dimensão	Margem
	A ₀	841 x 1189	10
	A ₁	594 x 841	10
	A ₂	420 x 594	7
a) →	A ₃	297 x 420	
b) →	A ₄	210 x 297	

3. Complete as frases nas linhas indicadas.
- a) O formato de papel A2 dá origem a dois formatos _____.
- b) O formato de papel A3 dá origem a dois formatos _____.

4. Assinale com **X** a alternativa que corresponde às dimensões de papel formato A4.

a) () 210 x 297 b) () 297 x 420 c) () 420 x 594

5. Entre os lápis HB e 2H, qual deles tem a grafita mais macia?

6. Complete as frases nas linhas indicadas.

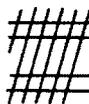
a) A unidade de medida utilizada em desenho técnico em geral é o _____.

b) A borracha usada para apagar o desenho deve ser _____, flexível e ter as extremidades chanfradas para facilitar o trabalho de apagar.

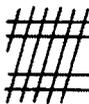
Caligrafia técnica

Escrever em caligrafia técnica

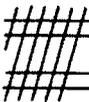
1. Escreva o alfabeto maiúsculo.



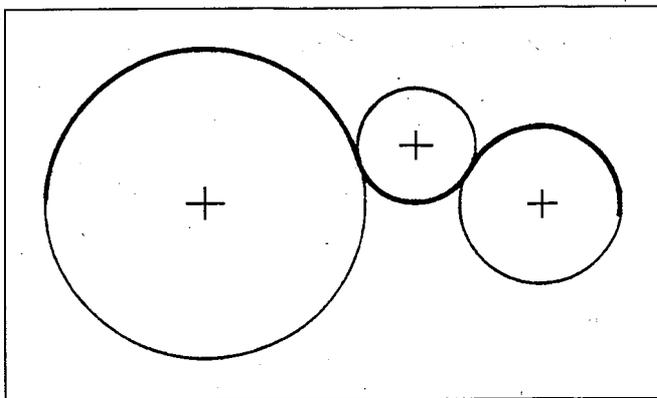
2. Escreva o alfabeto minúsculo.



3. Escreva os algarismos.



4. Escreva: 1. O nome completo da sua escola.
2. O seu nome completo.
3. O ofício que vai aprender.



Concordância de duas circunferências

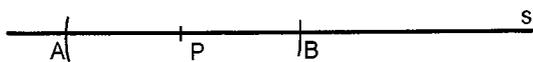
Construções geométricas fundamentais

1. Perpendicular (ponto sobre a reta)

Dados a reta s e o ponto P ,



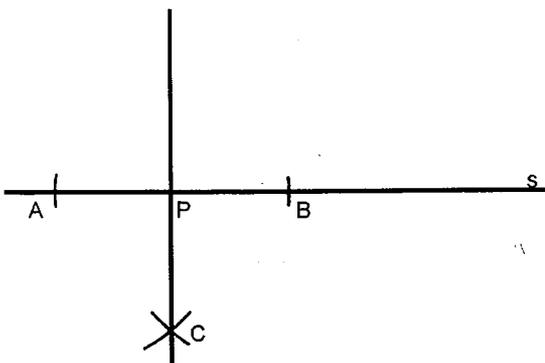
determine os pontos A e B , com qualquer abertura do compasso e com centro em P .



Determine o ponto C , com o compasso em uma abertura maior que \overline{AP} e centro em A e B .



Trace uma reta passando pelos pontos P e C . Essa reta é a perpendicular.

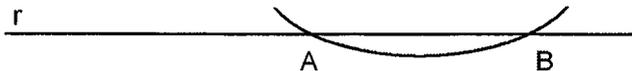


2. Perpendicular (ponto fora da reta)

Dados a reta r e o ponto P ,



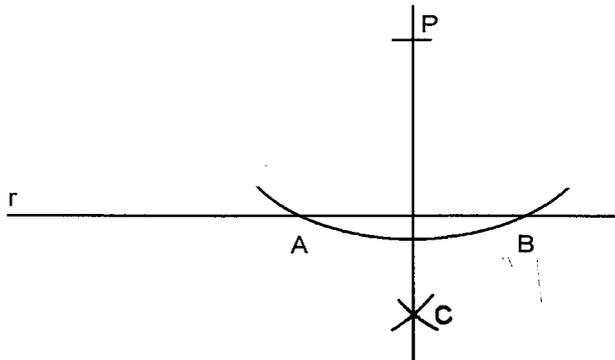
determine os pontos A e B ,
com o compasso em uma
abertura qualquer e centro em
 P .



Determine o ponto C , com o
compasso em uma abertura
qualquer maior que a metade
de \overline{AB} e centro em A e B .

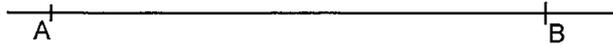


Trace uma reta passando pelos
pontos P e C . Essa reta é a
perpendicular.



3. Perpendicular na extremidade do segmento

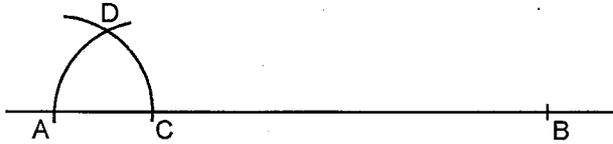
Dado o segmento **AB**,



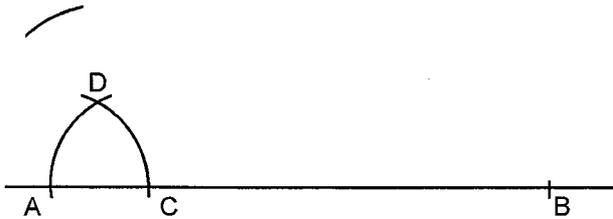
marque um ponto **C**, próximo à extremidade a ser traçada a perpendicular.



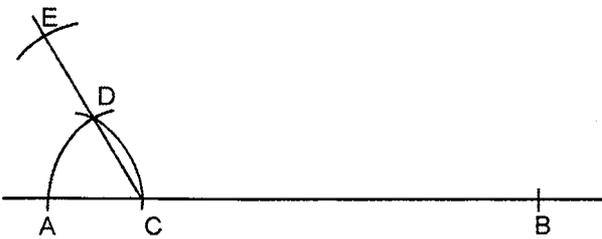
Determine o ponto **D**, com abertura do compasso \overline{AC} e centro em **A** e **C**.



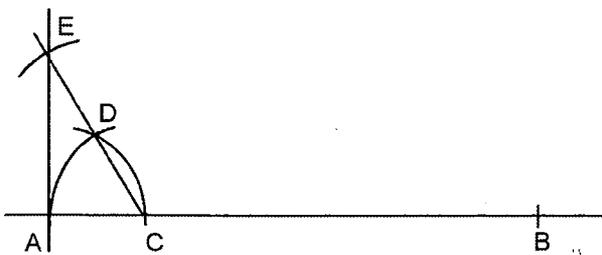
Trace um arco apostado ao ponto **C**, com abertura do compasso \overline{AC} e centro em **D**.



Trace uma reta passando pelos pontos **C** e **D** e obtenha o ponto **E**.



A perpendicular é a reta que passa pelos pontos **A** e **E**.



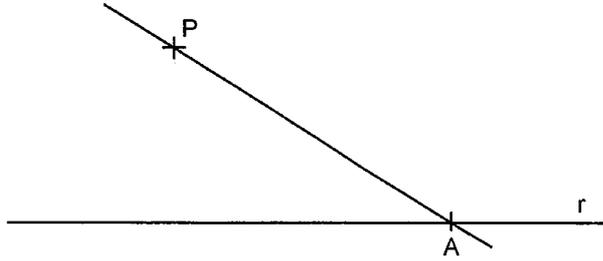
4. Paralela (ponto dado)

P

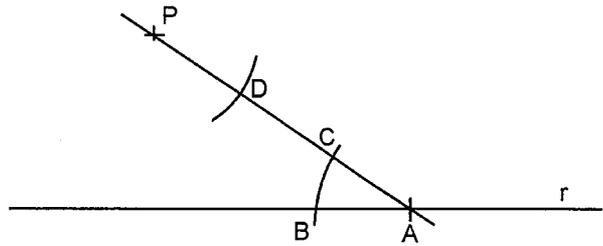
Dados a reta r e o ponto P ,

r

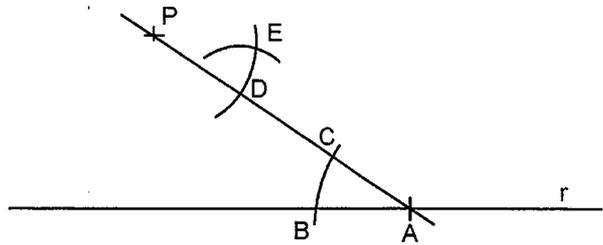
marque na reta r o ponto A deslocado de P e trace uma reta por P e A .



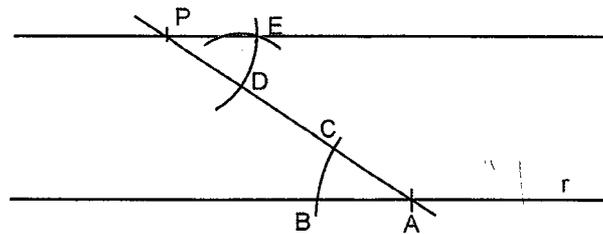
Determine os pontos B e C , com uma abertura qualquer de compasso e centro em A .



Determine o ponto D com a mesma abertura e centro em P .



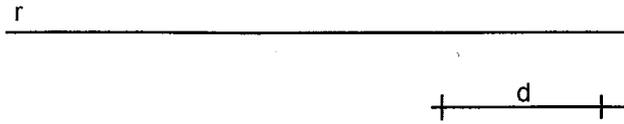
Marque o ponto E , com abertura do compasso \overline{BC} e centro em D .



Trace uma reta passando pelos pontos P e E . A reta que passa por P e E é paralela à reta r .

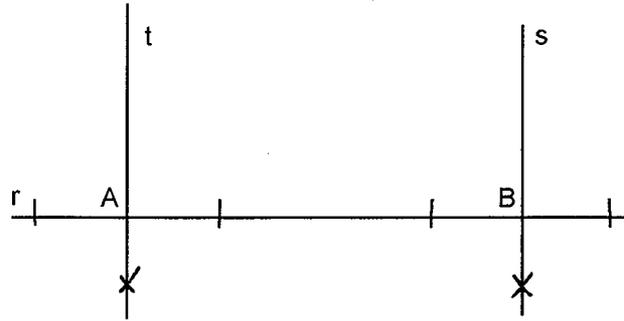
5. Paralela (distância dada)

Dadas a reta r e a distância d ,

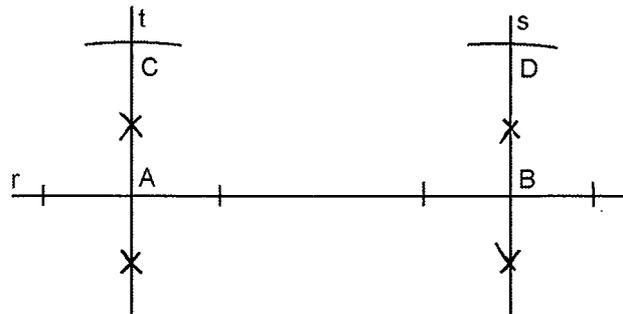


determine os pontos **A** e **B** sobre a reta r .

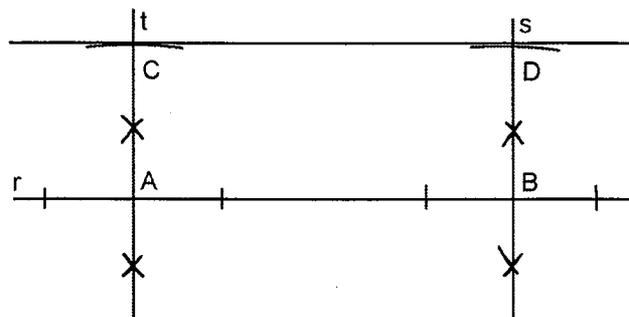
Trace as perpendiculares t e s pelos pontos **A** e **B**.



Marque a distância d nas perpendiculares t e s , com o compasso em **A** e **B**, e obtenha assim os pontos **C** e **D**.



Trace uma reta que passe pelos pontos **C** e **D**. Essa reta é paralela à reta r na distância dada d .

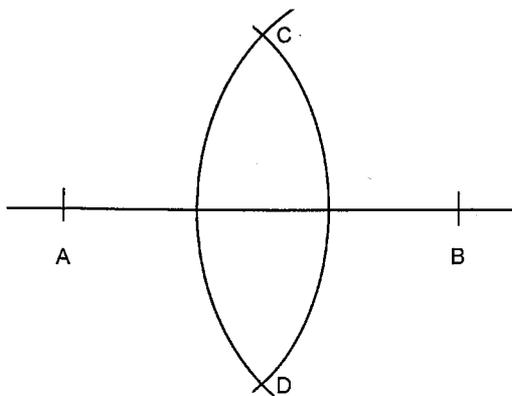


6. Mediatriz

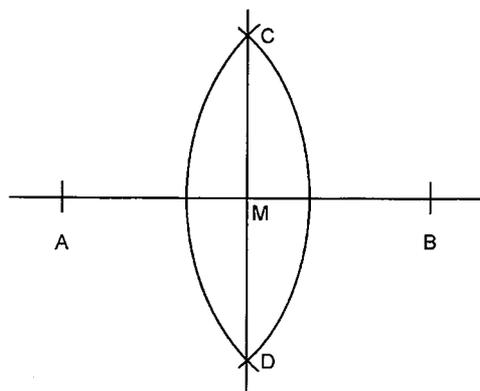
Dado o segmento de reta **AB**,



determine os pontos **C** e **D**,
traçando arcos com o
compasso em uma abertura
maior que a metade do
segmento **AB** e centro em **A** e
B.

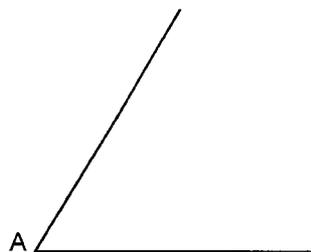


Trace uma perpendicular que
passe pelos pontos **C** e **D**.
Essa perpendicular é a
mediatriz. **M** é o ponto médio
do segmento **AB**.

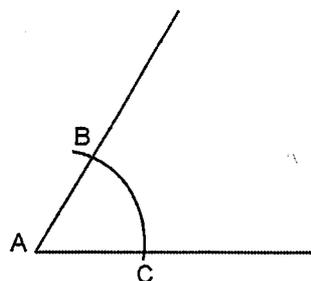


7. Bissetriz

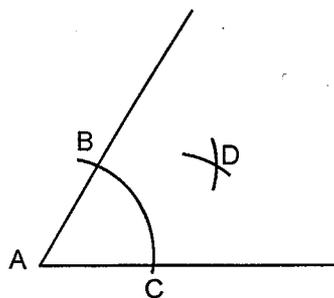
Dado o ângulo de vértice **A**,



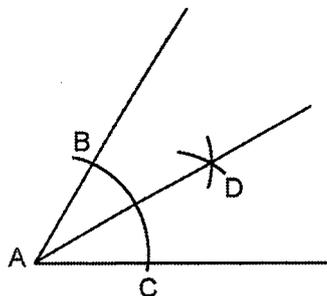
determine os pontos **B** e **C**, utilizando o
compasso com abertura qualquer e
centro em **A**.



Determine o ponto **D**, utilizando o compasso para traçar arcos do mesmo raio com centro em **B** e **C**.



Trace uma reta que passe pelos pontos **A** e **D**. Essa reta é a bissetriz do ângulo dado.

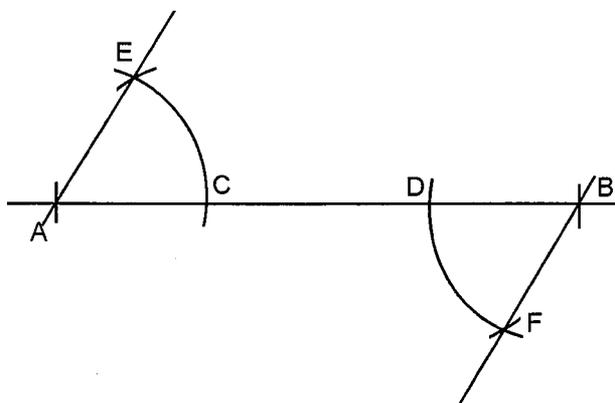


8. Divisão de segmento de reta em partes iguais (Neste exemplo: cinco partes).

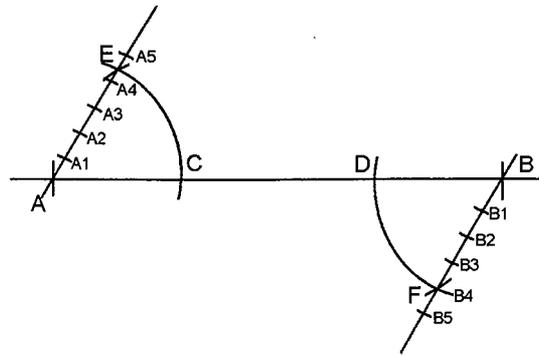
Dado o segmento de reta **AB**,



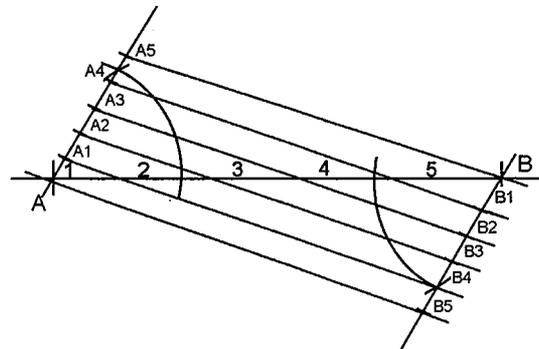
determine os pontos **C** e **D**, utilizando o compasso para traçar arcos de mesmo raio, com centro em **A** e **B**;
determine os pontos **E** e **F** por meio de arcos de mesmo raio, com centro em **C** e **D**; trace retas auxiliares que passem por **AE** e **BF**.



Marque com o compasso cinco espaços iguais sobre as retas auxiliares a partir de **A** e de **B**.

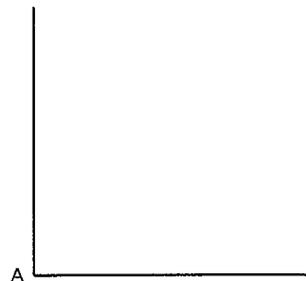


Trace retas ligando os pontos **A** com **B5**, **A1** com **B4** e assim sucessivamente, dividindo o segmento de reta em cinco partes iguais.

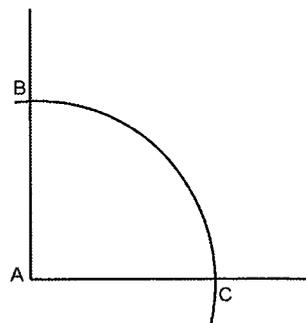


9. Divisão do ângulo reto em três partes iguais

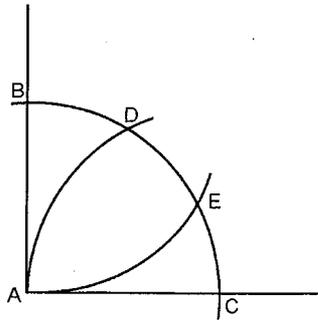
Dado o ângulo reto de vértice **A**,



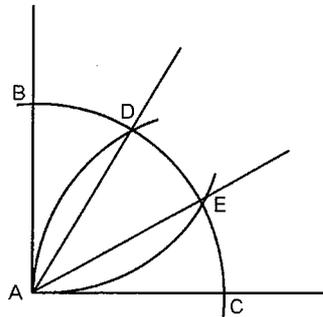
determine os pontos **B** e **C**, utilizando o compasso com qualquer abertura e centro em **A**.



Com a mesma abertura e centro em **C** e **B**, determine os pontos **D** e **E**.

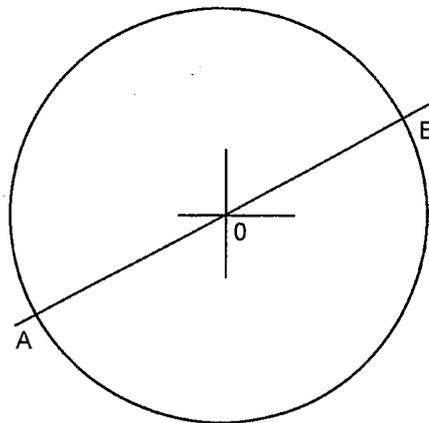


Trace retas que passem por **AD** e **AE**. Essas retas dividem o ângulo em três partes iguais.

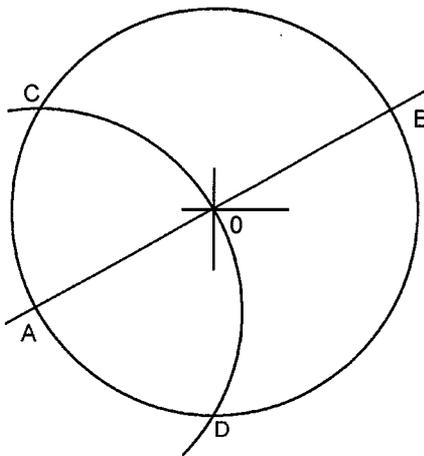


10. Triângulo equilátero inscrito (Divisão da circunferência em três partes iguais)

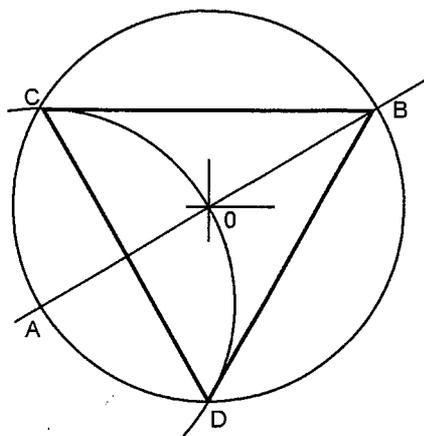
Dada a circunferência de centro **O**, trace uma reta passando pelo centro, obtendo assim o diâmetro **AB**.



Determine os pontos **C** e **D** por meio de um arco, com centro em **A**, passando pelo centro **O**.

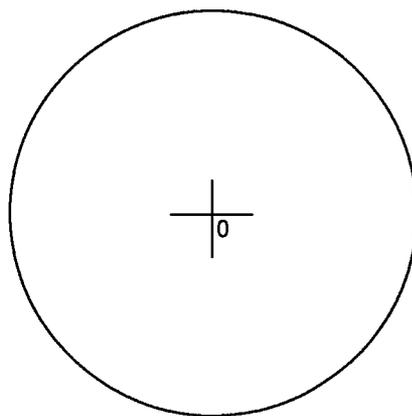


Ligue os pontos **B**, **C** e **D**, determinando o triângulo equilátero inscrito na circunferência.

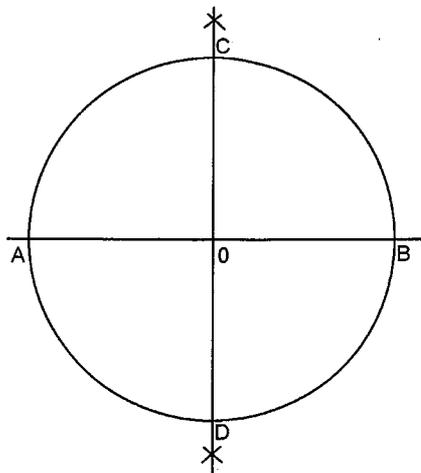


11. Quadrado inscrito (Divisão da circunferência em quatro partes iguais)

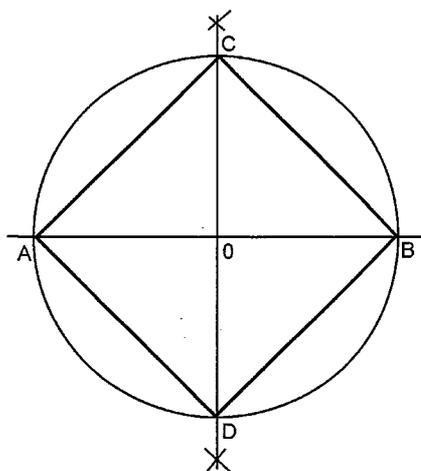
Dada a circunferência de centro **O**,



determine os pontos **C** e **D**,
traçando o diâmetro **AB** e sua
mediatriz.

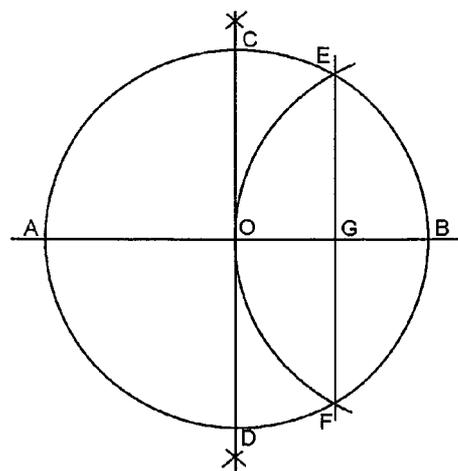


Ligando os pontos **A**, **C**, **B** e **D** por
segmentos de reta, obtêm-se o
quadrado inscrito.

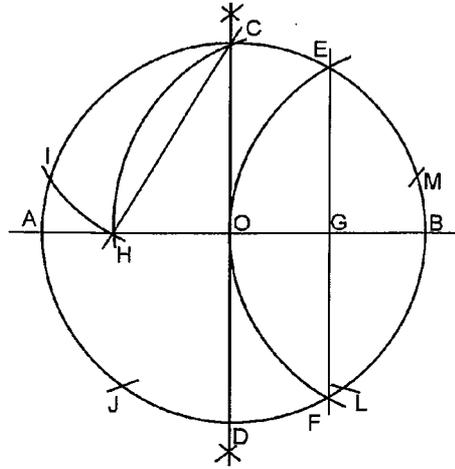


12. Pentágono inscrito (Divisão da circunferência em cinco partes iguais)

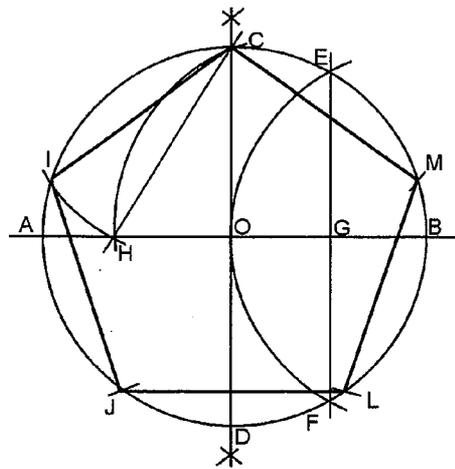
Dada a circunferência de centro **O**:
trace o diâmetro **AB** e sua
mediatriz, determinando os pontos
C e **D**; trace também a mediatriz de
OB, determinando os pontos **E**, **F** e
G.



Determine **H** com abertura do compasso \overline{GC} e centro em **G**. O segmento **CH** divide a circunferência em cinco partes iguais, ou seja: **CI**, **IJ**, **JL**, **LM** e **MC**.

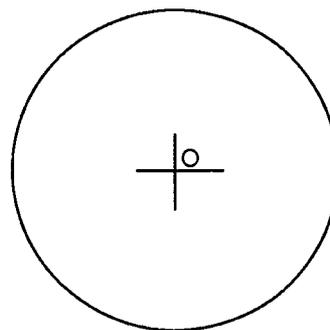


Unindo os pontos que dividem a circunferência, obtêm-se o pentágono inscrito.

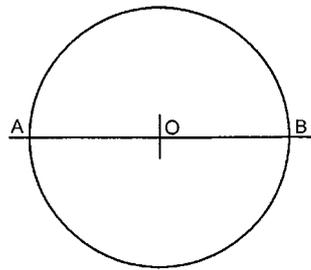


13. Hexágono inscrito (Divisão da circunferência em seis partes iguais)

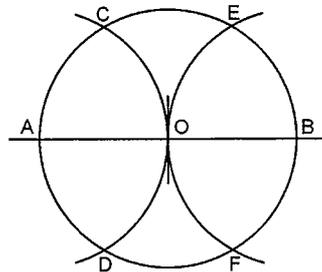
Dada a circunferência de centro **O**,



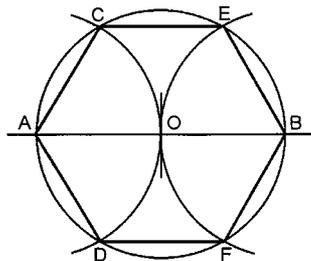
trace uma reta que passe pelo centro e obtenha os pontos **A** e **B**.



Trace os arcos com o compasso em **A** e **B**, passando pelo centro **O**, e obtenha, no cruzamento com a circunferência, os pontos **C**, **D**, **E** e **F**. Esses pontos dividem a circunferência em seis partes iguais.



Unindo os pontos que dividem a circunferência, obtêm-se o hexágono inscrito.

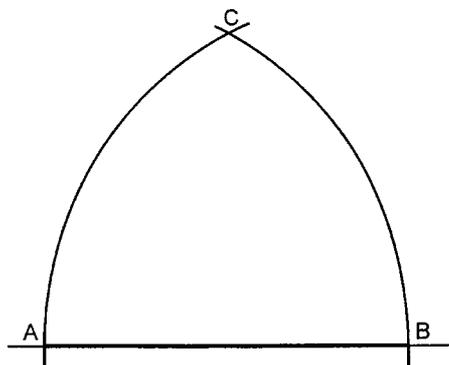


14. Triângulo equilátero dado o lado

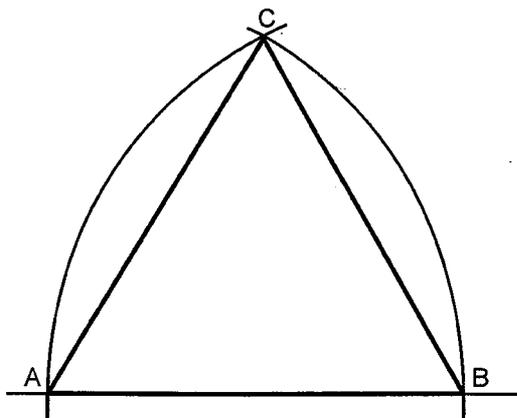
Dado o segmento **AB**, lado do triângulo,



determine o ponto **C**, traçando arcos com abertura \overline{AB} , com centro em **A** e **B**.

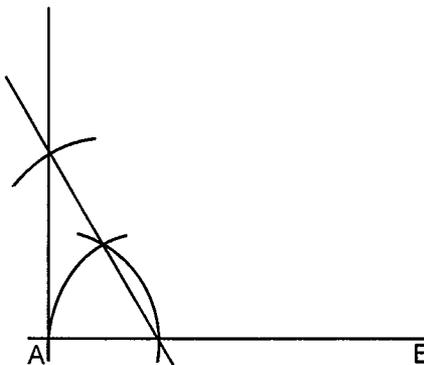


Ligando os pontos **A**, **C** e **B** com segmentos de reta, obtêm-se o triângulo equilátero.

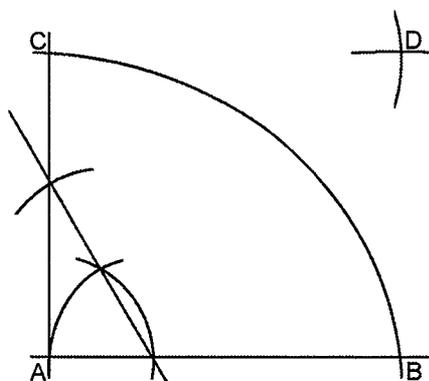


15. Quadrado dado o lado

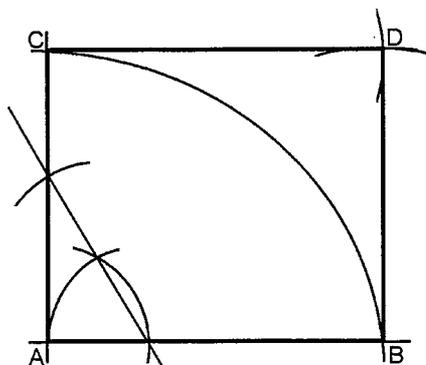
Dado o segmento **AB**, lado do quadrado, trace uma perpendicular na extremidade **A**.



Determine **C** na perpendicular com abertura \overline{AB} e centro em **A**.
Determine o ponto **D** com a mesma abertura, por meio de arcos e centro em **B** e **C**.

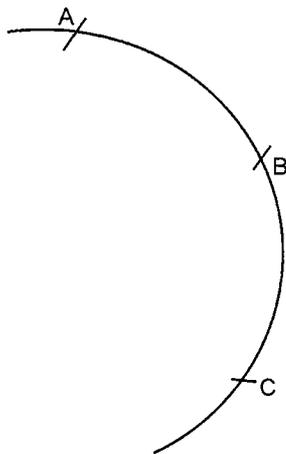


Unindo os pontos **A**, **C**, **D** e **B** por segmentos de reta, obtêm-se o quadrado.

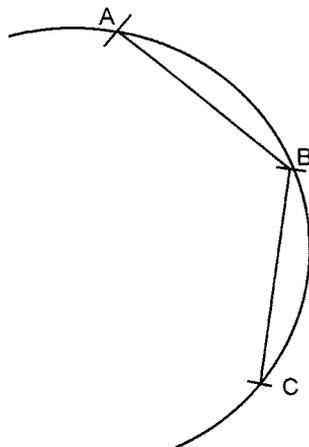


16. Determinar o centro do arco

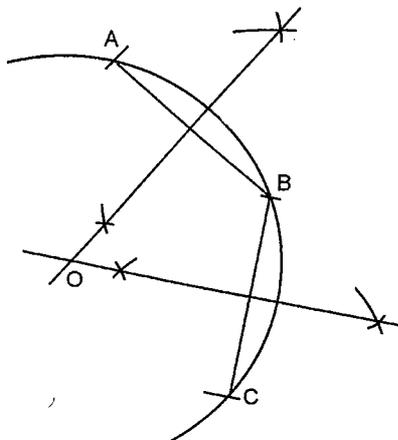
Dado o arco, marque sobre eles três pontos **A**, **B** e **C**.



Trace os segmentos **AB** e **BC**.



Trace as mediatrizes dos segmentos **AB** e **BC**. O cruzamento das mediatrizes determina o ponto **O**, que é centro do arco.



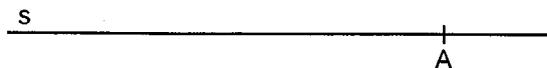
Observação

Este processo é válido também para determinar o centro da circunferência.

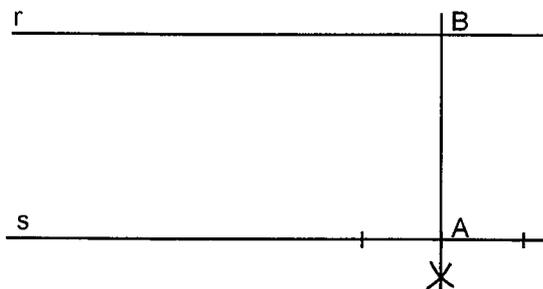
17. Concordância entre retas paralelas



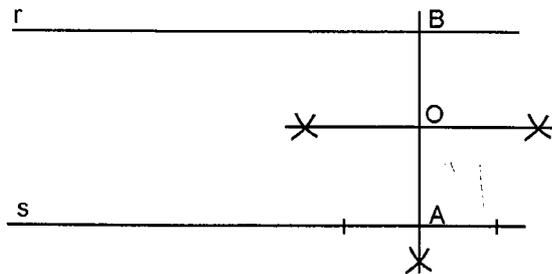
Dadas as retas **r** e **s**, paralelas e o ponto **A**, contido em **s**,



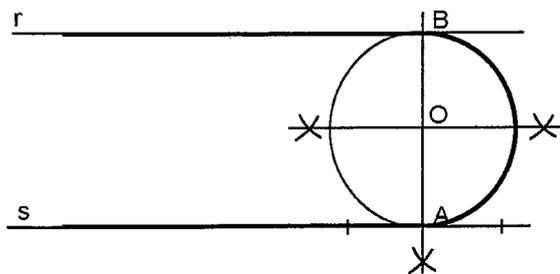
trace uma perpendicular pelo ponto **A**, determinando o ponto **B**.



Trace a mediatriz do segmento **AB**, obtendo o ponto **O**.

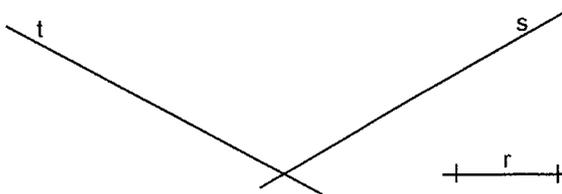


Trace o arco de concordância entre as duas retas com abertura \overline{OA} e centro em O . Os pontos de tangência são A e B .

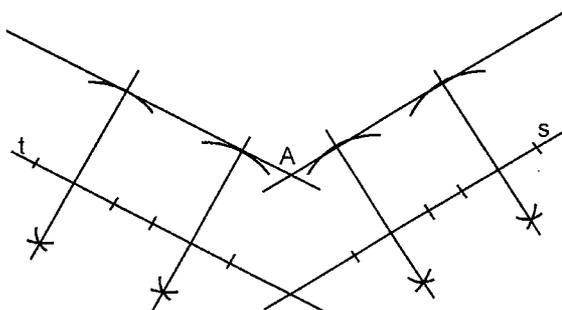


18. Concordância entre retas concorrentes

Dado o ângulo formado pelas retas t e s e o raio do arco de concordância r ,

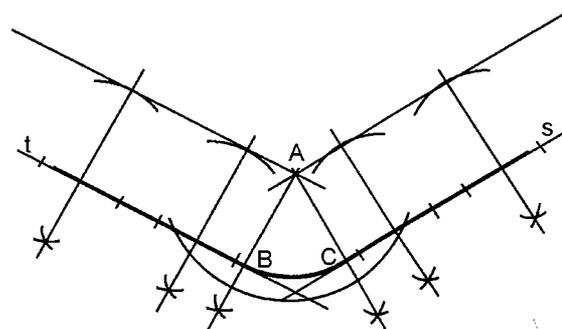


determine o ponto A , traçando paralelas às retas t e s .



Determine os pontos de tangência B e C , traçando a partir de A , linhas perpendiculares às retas t e s , respectivamente.

Trace o arco que concordará com as retas dadas.

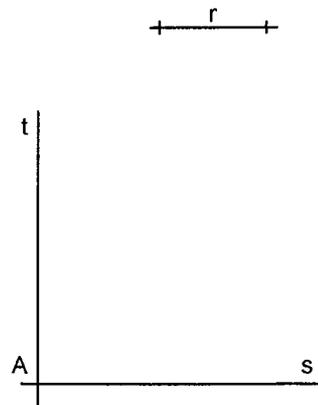


Observação

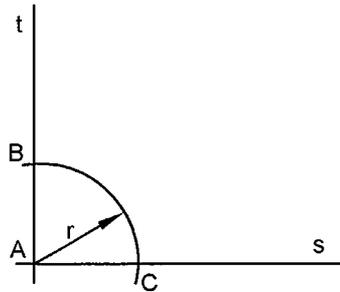
Este processo é válido para concordância entre retas concorrentes que formam qualquer ângulo.

19. Concordância no ângulo reto

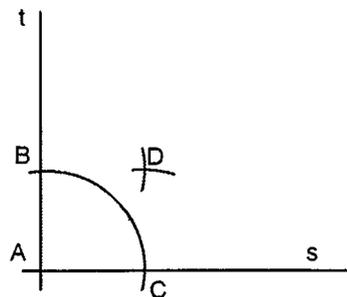
Dadas as retas concorrentes **t** e **s** formando um ângulo de 90° e o raio do arco de concordância **r**,



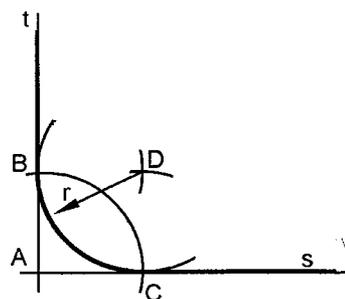
trace um arco determinando os pontos **B** e **C**, com o compasso com abertura **r** e centro em **A**.



Determine **D** com abertura **r** e centro em **B** e **C**.

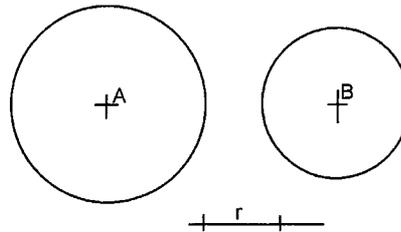


Trace a circunferência determinando a concordância com as retas **t** e **s**, abertura **r** e centro em **D**.

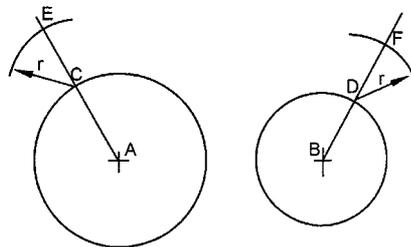


20. Concordância entre circunferências

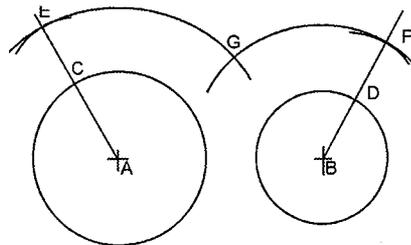
Dadas duas circunferências e o raio do arco de concordância r ,



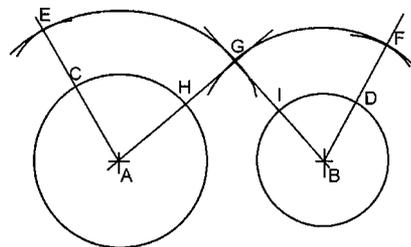
determine os pontos **C** e **D**, traçando semi-retas a partir de **A** e **B**. Em seguida, determine **E** e **F**, com abertura r e centro em **C** e **D**, respectivamente.



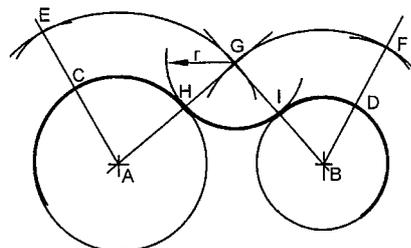
Determine o ponto **G** traçando os arcos: com abertura \overline{AE} e centro em **A** e com abertura \overline{BF} e centro em **B**.



Determine os pontos de tangência **H** e **I**, ligando **A** com **G** e **B** com **G**.



Trace o arco de concordância entre suas circunferências com centro em **G** e abertura em r .

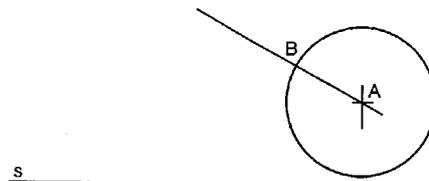


21. Concordância entre reta e circunferência

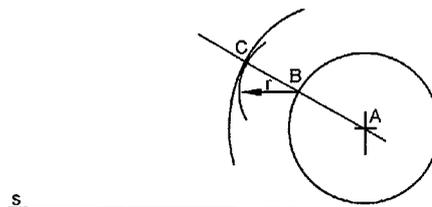
Dados a reta s , a circunferência de centro A e o raio de concordância r ,



determine B na circunferência traçando uma semi-reta a partir de A .

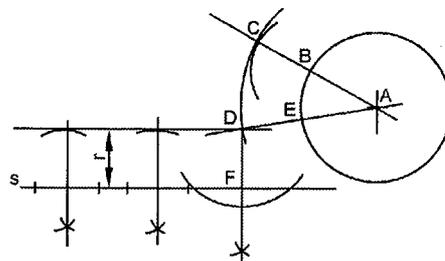


Determine o ponto C com abertura do compasso r e centro em B . Trace um arco com abertura \overline{AC} e centro em A .

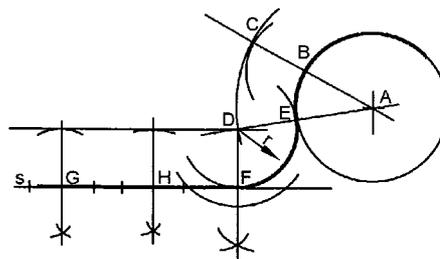


Trace uma paralela à reta s na distância r , determinando o ponto D . Ligue D com A , obtendo o ponto E .

Trace uma perpendicular à reta s partindo de D , determinando o ponto F . E e F são os pontos de tangência.



Trace o arco que fará a concordância com abertura r e centro em D .



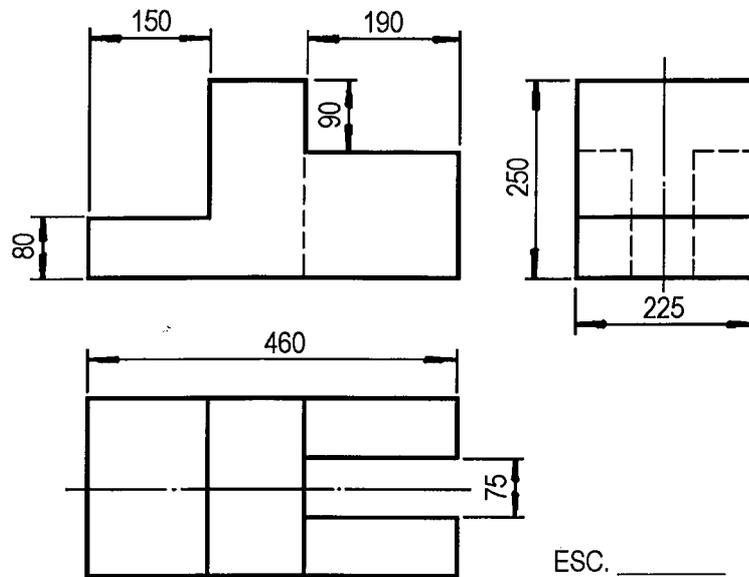
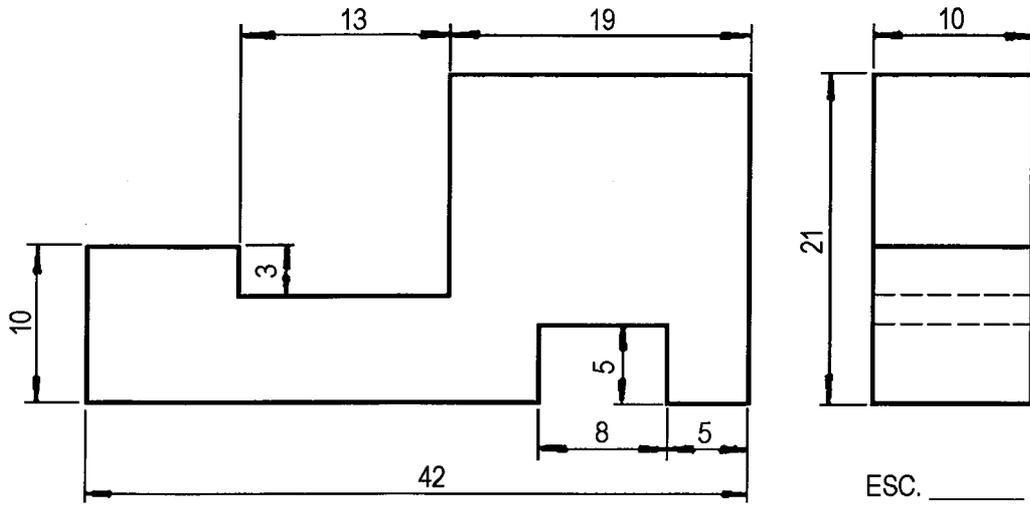
CAPÍTULO 3

Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Escala - Determinar escalas sendo dadas as projeções.

Determine e escreva as escalas dos desenhos abaixo.



Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Escala - Completar quadros, relacionando valores da escala.

Complete as lacunas do quadro abaixo conforme o exemplo A.

	Dimensão da peça	Escala	Dimensão do des.		Dimensão da peça	Escala	Dimensão do des.
A	40	1:10	4			2:1	15
	50		50		120		60
		1:2	12		300	1:10	
	25		125			1:2	70
		5:1	20		45	5:1	
		1:5	18		310		62
	6	2:1			2000		100
	100		10			10:1	40
		1:1	25,4			1:5	40
	75		15		5	5:1	

Escolha entre as quatro alternativas de escalas e faça um círculo na resposta certa, conforme o exemplo A.

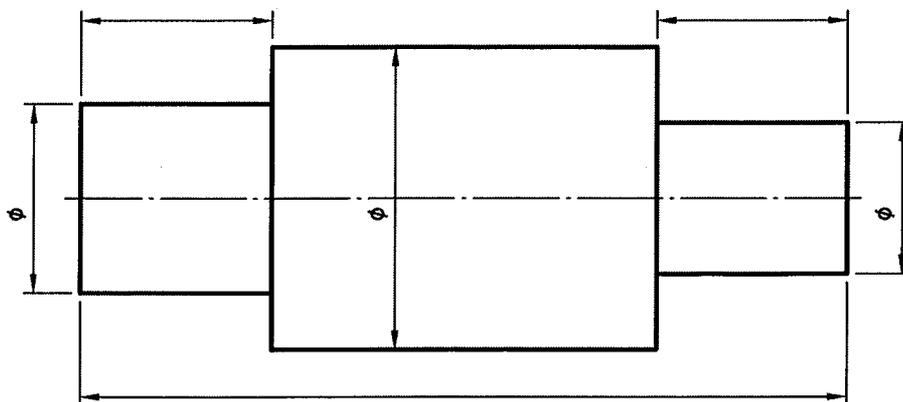
	Dimensão da peça	Dimensão do desenho	Escala			
			1:2	5:1	1:20	2:1
A	120	240	1:2	5:1	1:20	2:1
	25	125	1:10	5:1	2:1	1:5
	70	70	2:1	1:2	1:1	5:1
	40	400	10:1	5:1	1:10	1:1
	90	45	1:5	1:10	2:1	1:2
	35	7	2:1	1:5	1:2	5:1
	20	200	1:10	1:1	10:1	1:2
	5	25	5:1	2:1	1:5	1:10
	52	26	2:1	1:1	5:1	1:2
	108	540	5:1	1:5	1:2	1:1
	105	21	1:2	2:1	1:10	1:5

Desenho
Exercícios

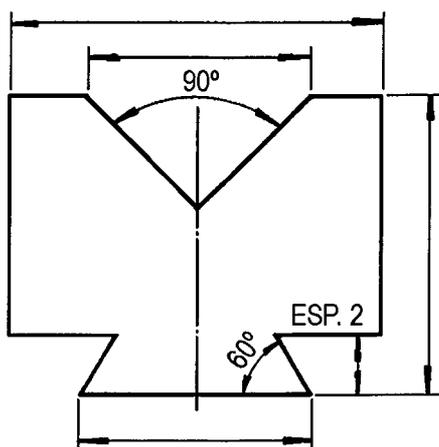
Nome _____
Nº _____ Turma _____

Escala - Determinar as cotas e distribuí-las nos desenhos.

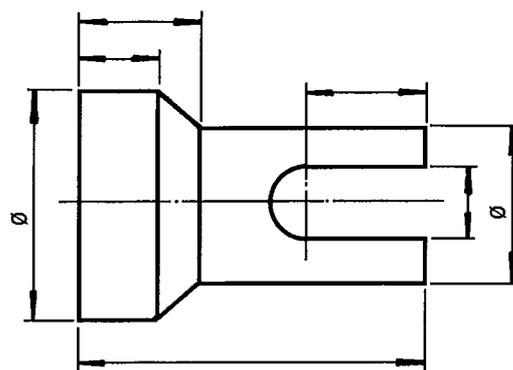
Determine e coloque as cotas nos desenhos. Utilize a régua milimetrada.



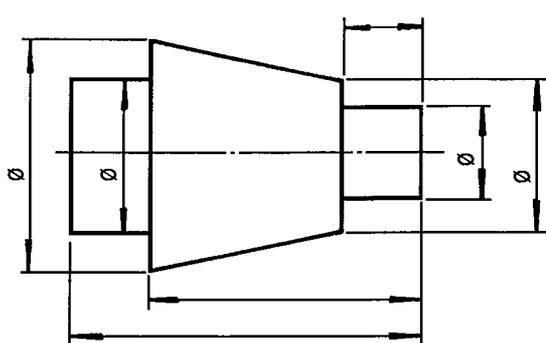
ESC. 5:1



ESC. 2:1



ESC. 1:5



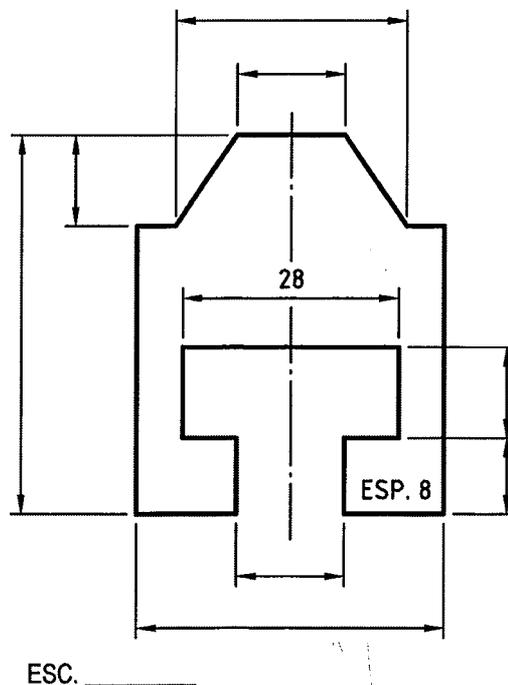
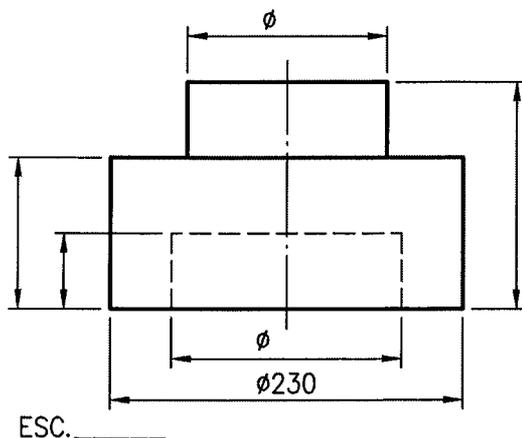
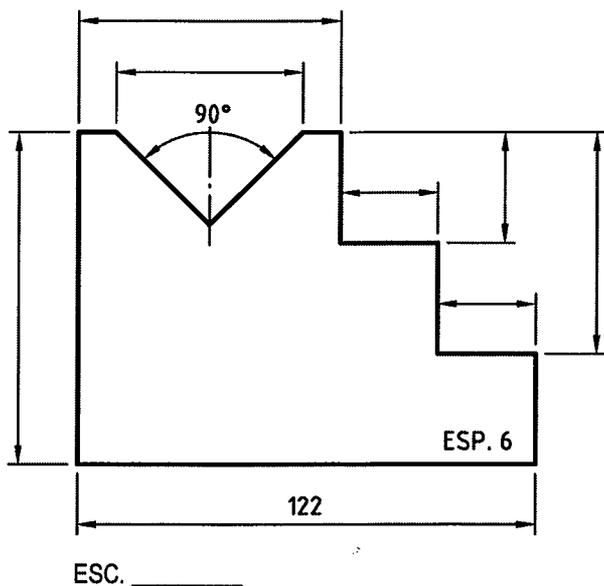
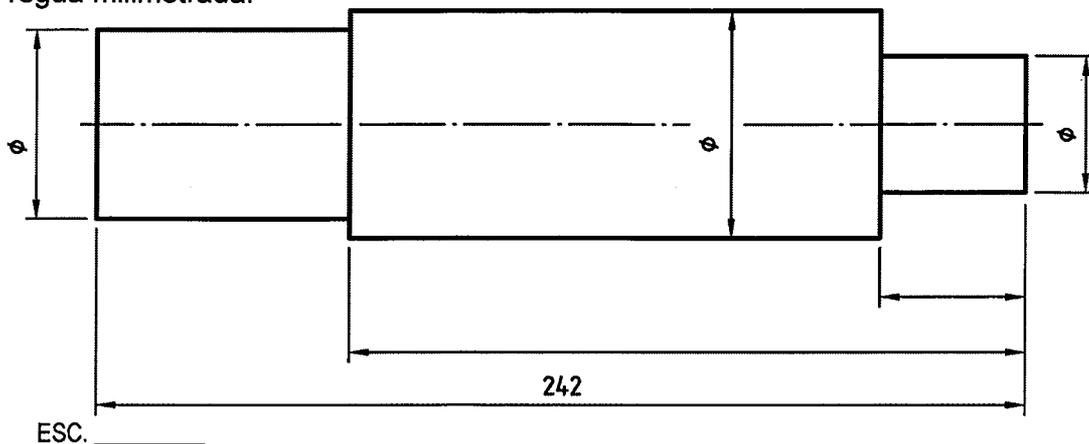
ESC. 1:2

Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Escala - Determinar escalas e cotas.

Determine e anote a escala dos desenhos e coloque as cotas que faltam. Utilize a régua milimetrada.

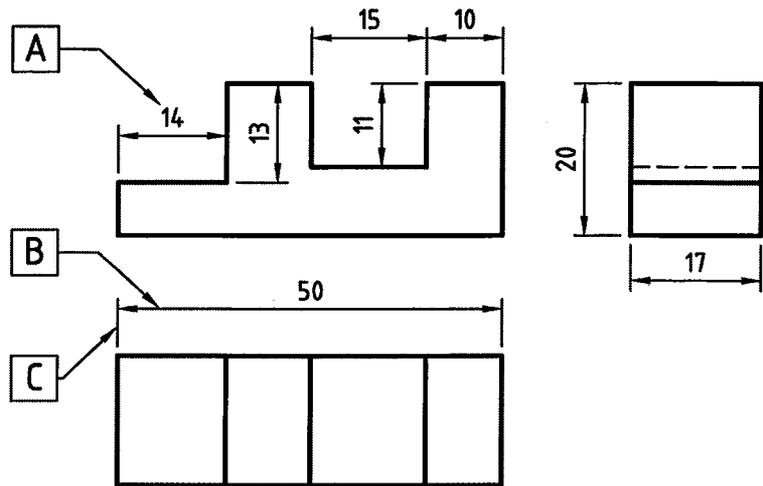


CAPÍTULO 4

Cotagem - Identificar e aplicar os elementos de cotagem.

1. Analise o desenho técnico ao lado e responda às questões a seguir.

- a) Escreva dentro dos parênteses as letras correspondentes a cada elemento de cotagem.
- () Linha de cota
() Linha auxiliar de cota
() Cota

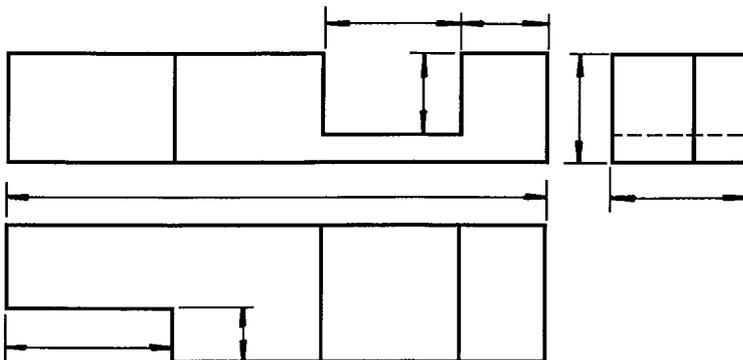


- b) Escreva as cotas básicas. Comprimento: _____, altura: _____ e largura: _____.
- c) Escreva as cotas básicas que determinam o tamanho do rasgo: ____ e ____.
- d) Escreva a cota que determina a localização do rasgo: _____.
- e) Escreva as cotas que determinam o tamanho do rebaixo: ____ e ____.

2. Complete as frases, escrevendo as palavras faltantes sobre as linhas indicadas.

- a) As linhas auxiliares de cota não encostam nas linhas do _____.
- b) A linha de _____ encosta na linha auxiliar de cota.
- c) A linha _____ ultrapassa a linha de cota.
- d) A _____ não encosta na linha de cota.
- e) A linha de _____ é uma linha _____ e tem setas nas extremidades.
- f) Na linha de cota vertical a cota deve ser escrita de baixo para _____ e ao lado _____ a linha de cota.
- g) Na linha de cota horizontal a cota deve ser escrita da _____ para a _____ e sobre a linha de cota.

3. Faça a cotagem tomando as medidas no desenho.

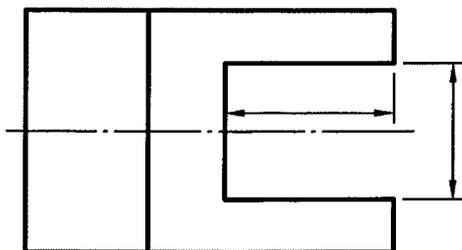
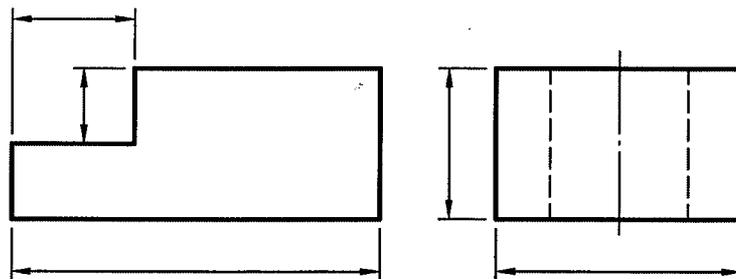
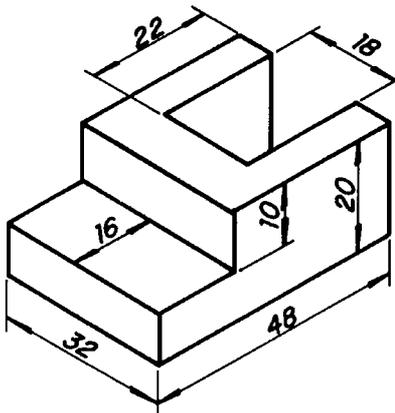
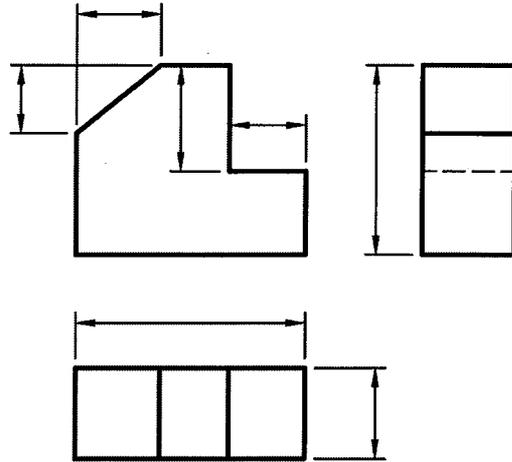
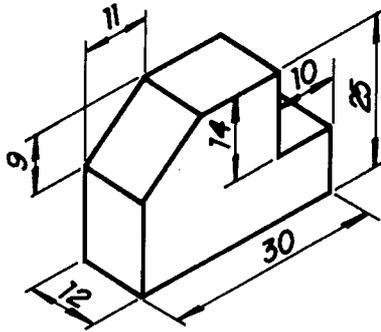


Desenho /
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas – A.

Observe as perspectivas e escreva as cotas nas projeções.

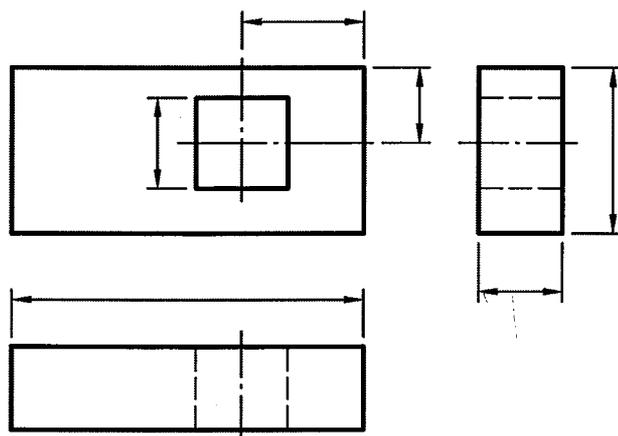
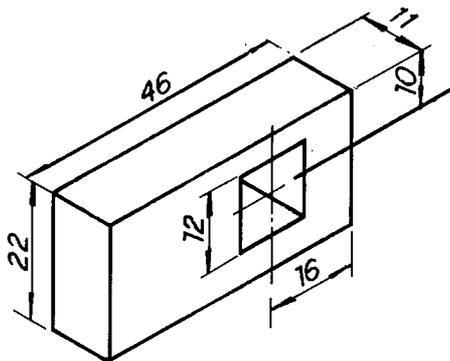
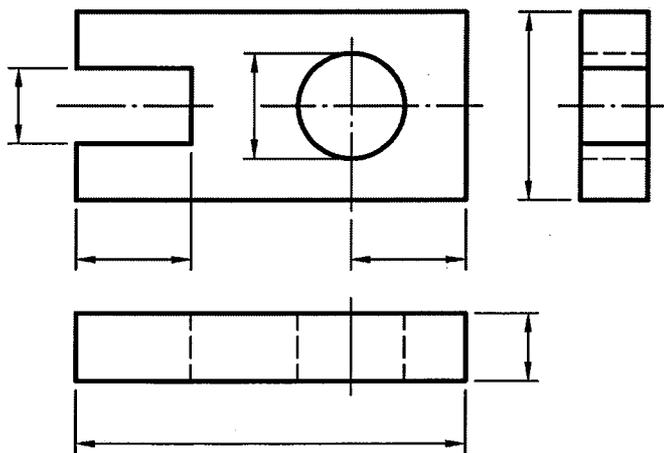
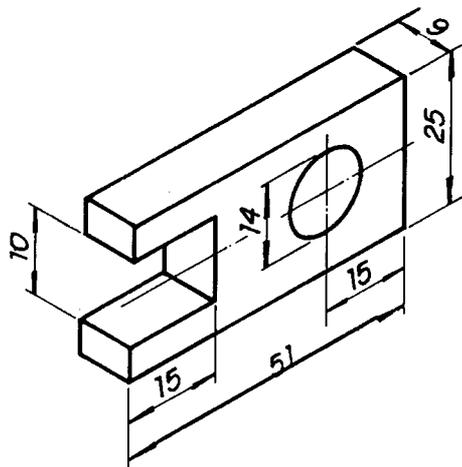


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - B.

Observe as perspectivas e escreva as cotas nas projeções.



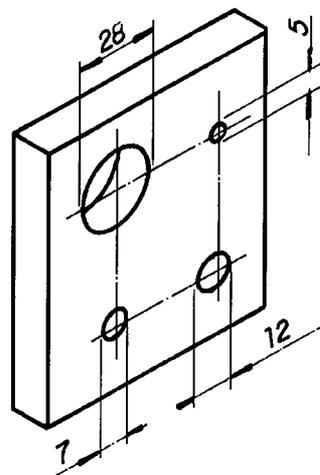
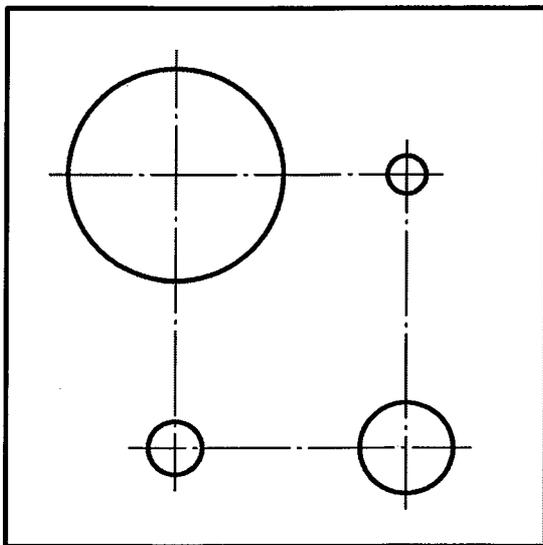
Desenho
Exercícios

Nome _____
Nº _____ Turma _____

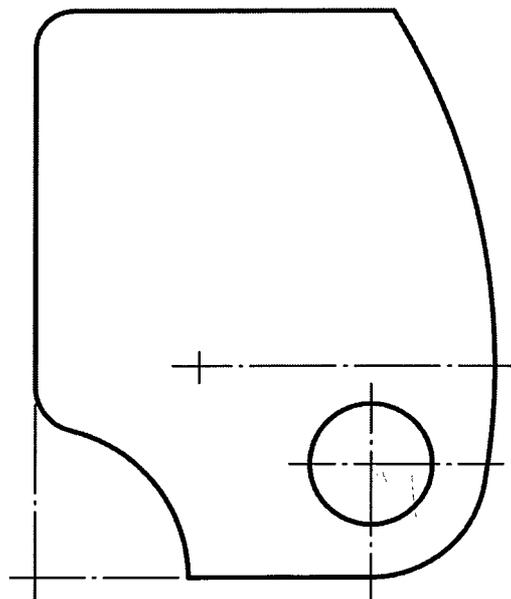
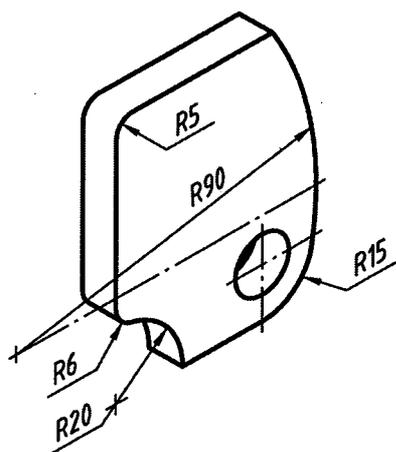
Cotagem - Cotar elementos.

Nas projeções apresentadas, faça somente a cotagem dos elementos citados.

Diâmetros



Raios



Desenho

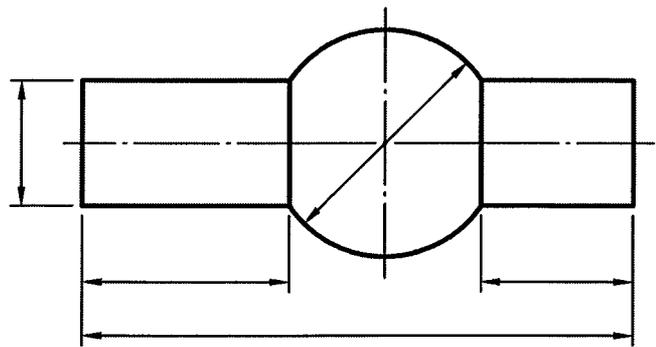
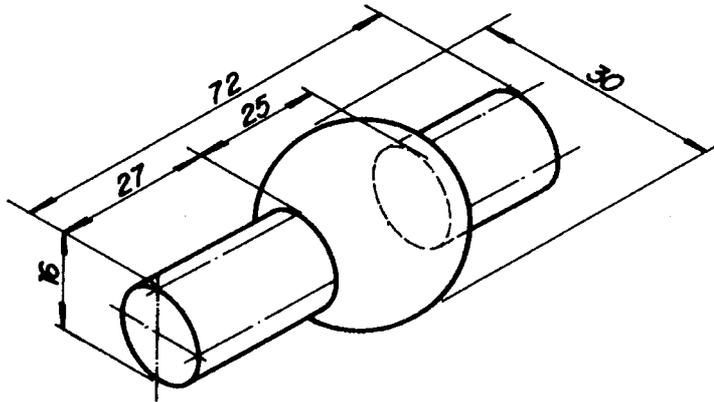
Nome _____

Exercícios

Nº _____ Turma _____

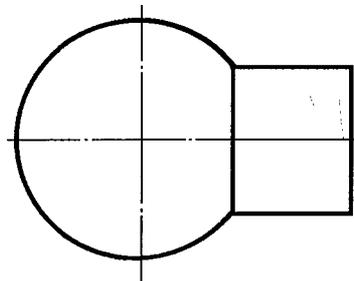
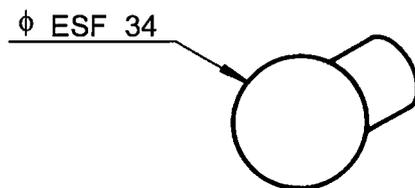
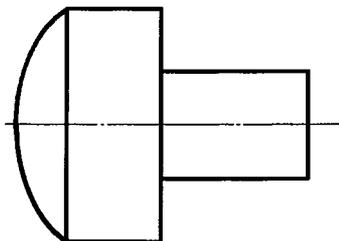
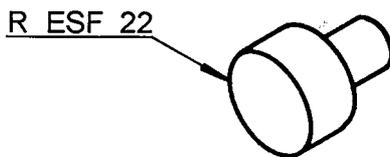
Cotagem - Distribuir cotas em projeções.

a) Analise a perspectiva e coloque as cotas na projeção.



b) Na projeção apresentada, faça somente a cotagem do elemento citado.

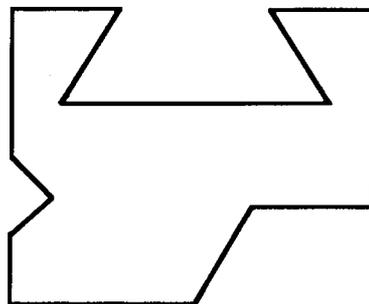
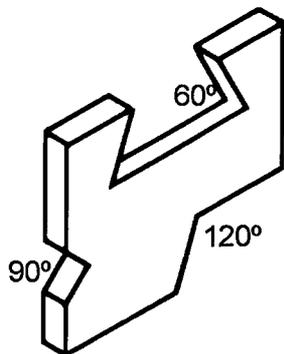
Esférico



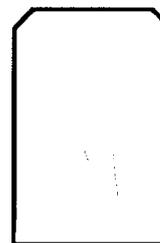
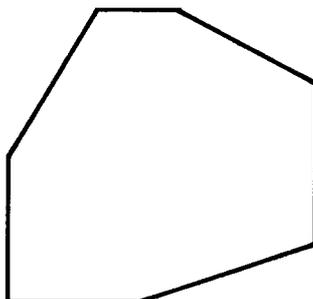
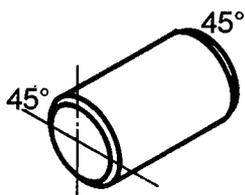
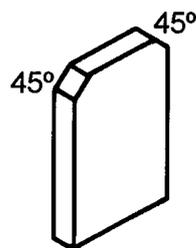
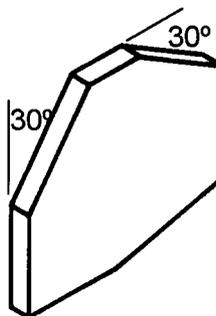
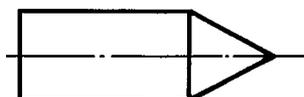
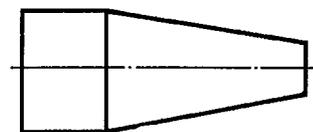
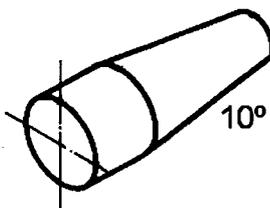
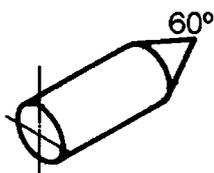
Cotagem - Cotar elementos - A.

Nas projeções apresentadas, faça somente a cotagem dos elementos citados.

a) Ângulos.



b) Chanfros.



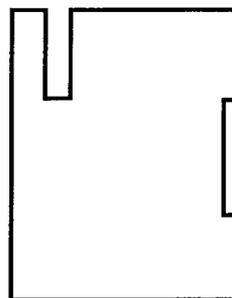
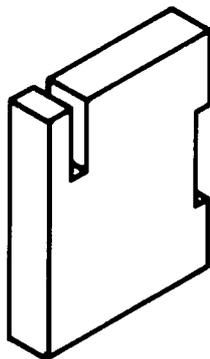
Desenho
Exercícios

Nome _____
Nº _____ Turma _____

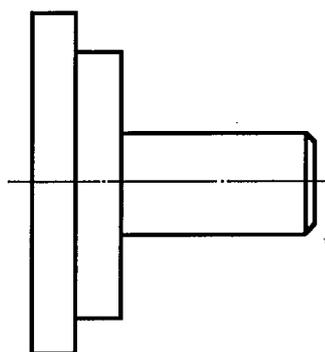
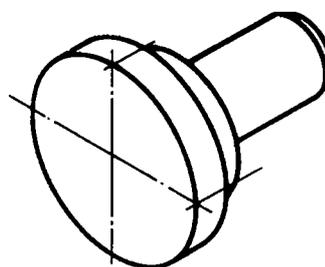
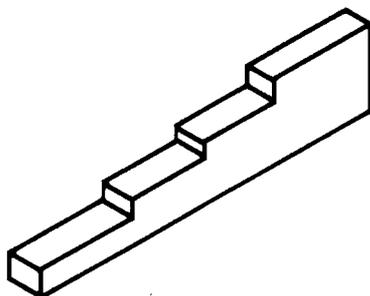
Cotagem - Cotar elementos - B.

Nas projeções apresentadas, faça somente a cotagem dos elementos citados.

a) Espaços reduzidos.



b) Comprimentos por face de referência.

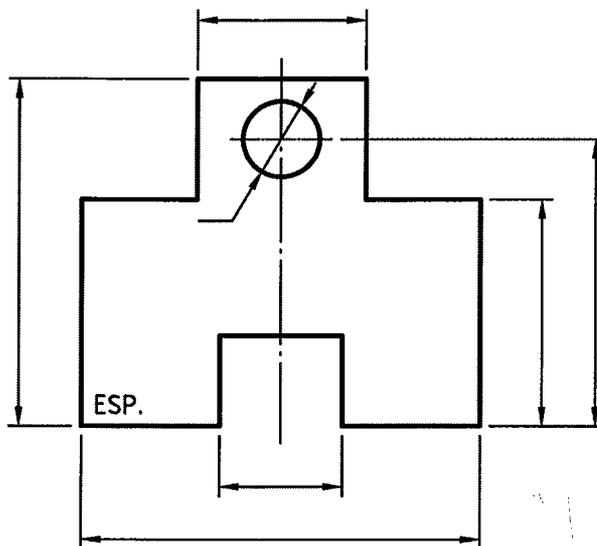
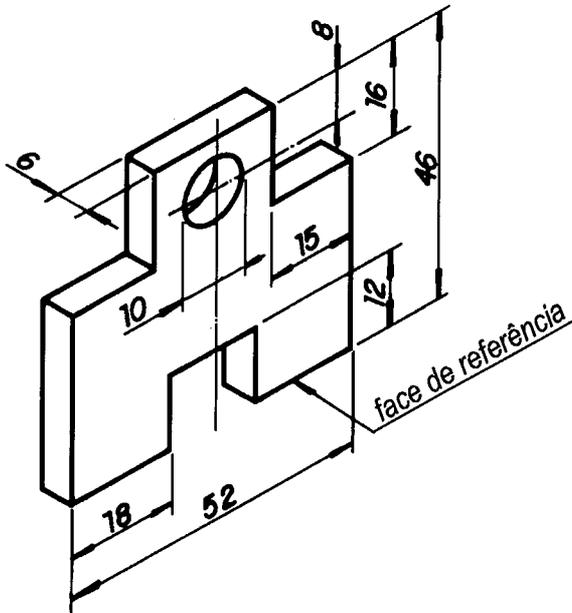


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - A.

Analise as perspectivas e coloque as cotas nas projeções.

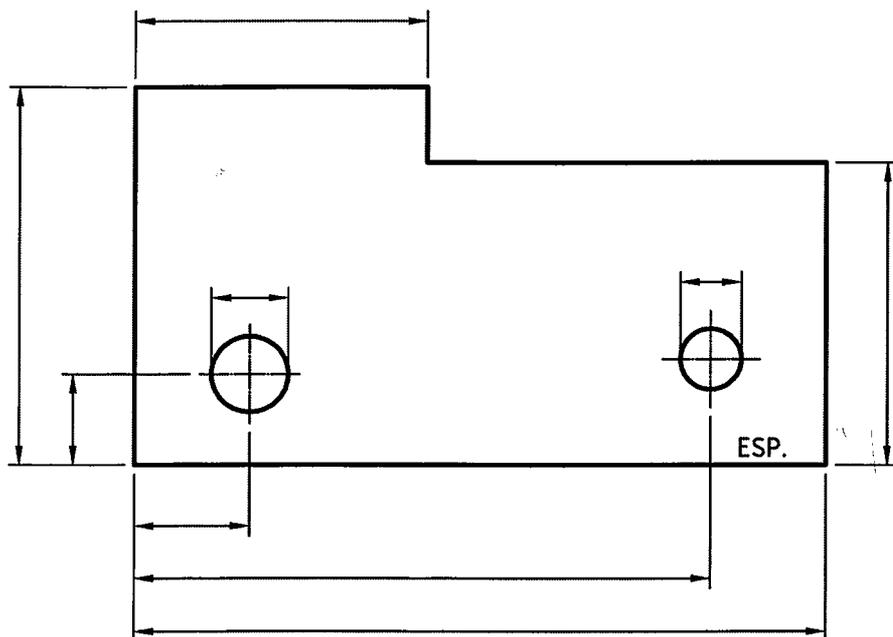
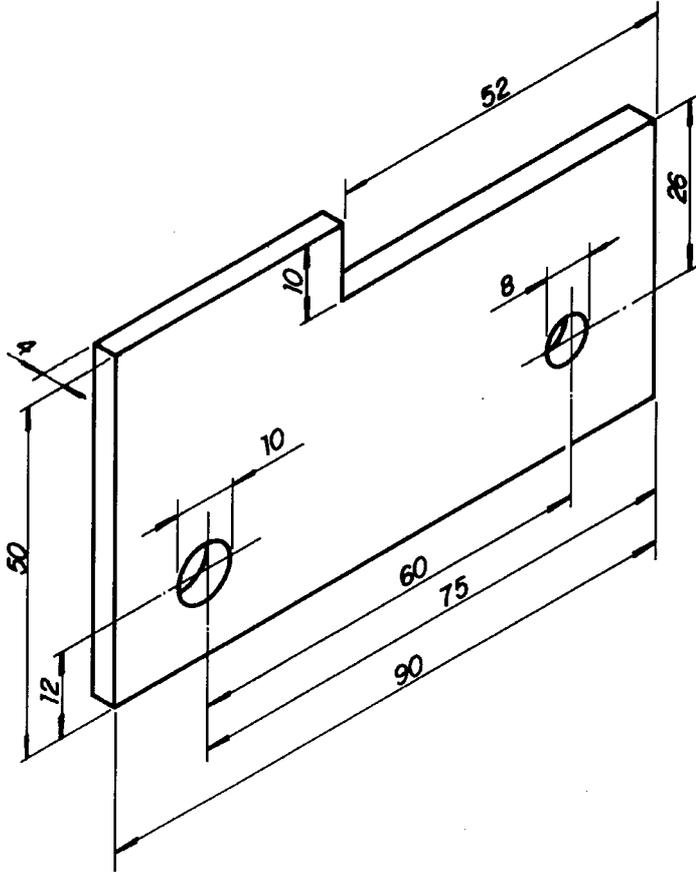


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - B.

Analise as perspectivas, calcule as cotas e coloque-as nas projeções.

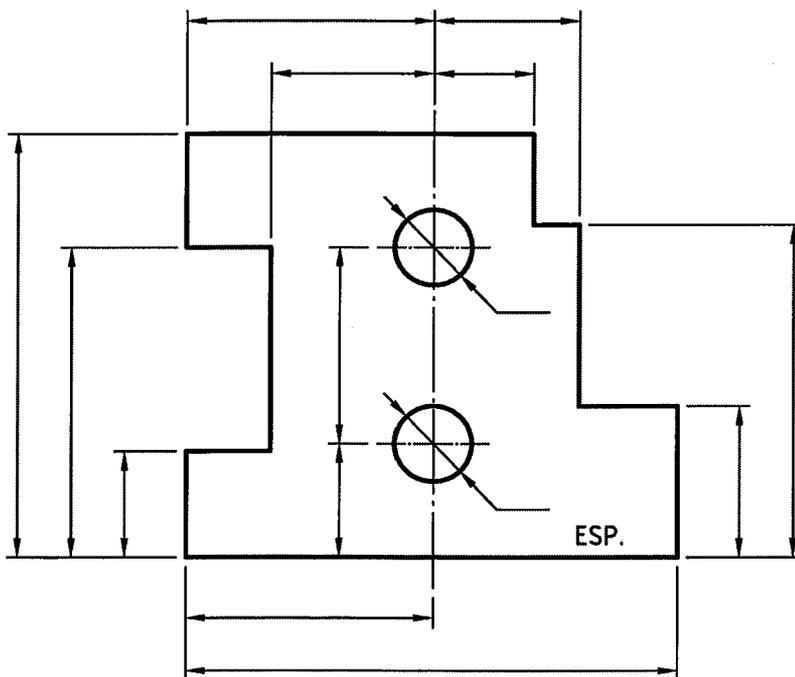
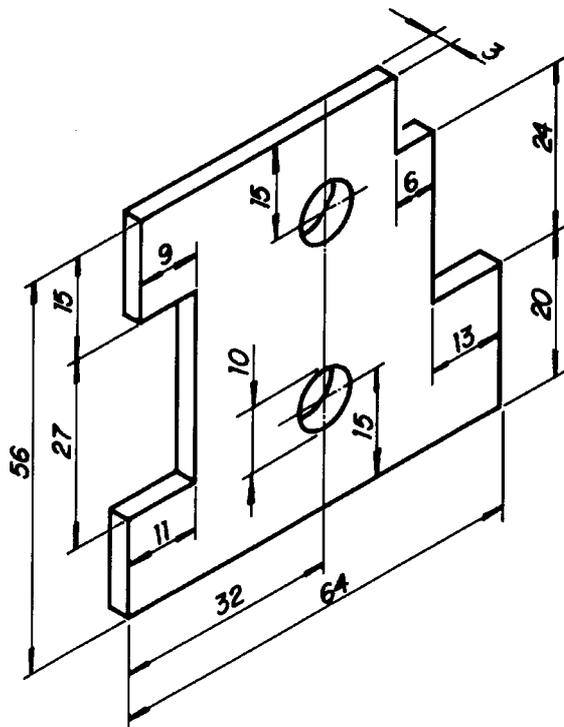


Desenho :
Exercícios :

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - C.

Analise as perspectivas e coloque as cotas nas projeções.

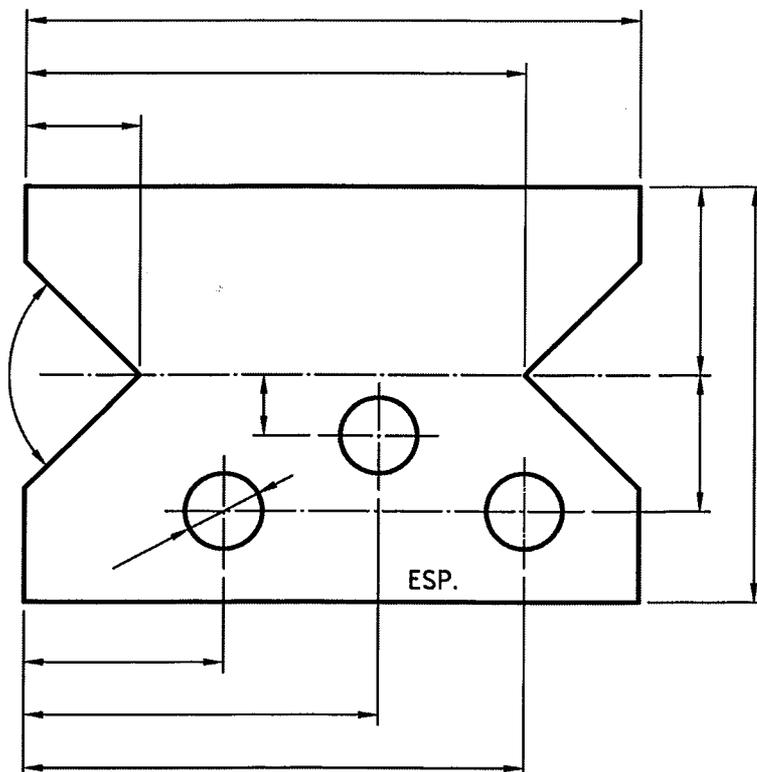
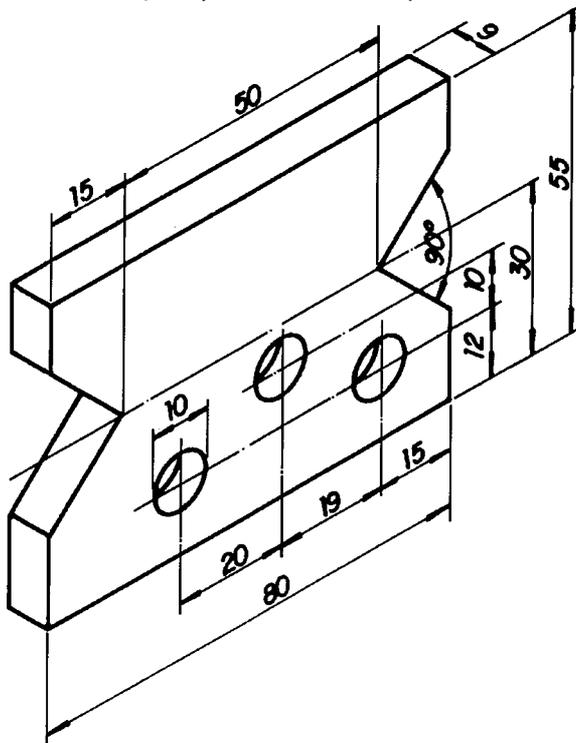


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - D.

Analise as perspectivas e coloque as cotas nas projeções.

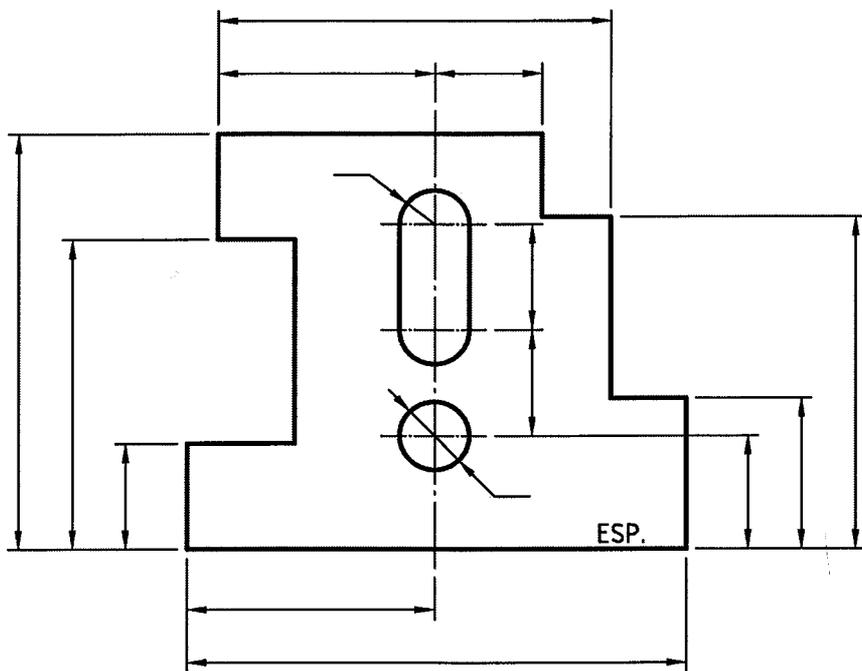
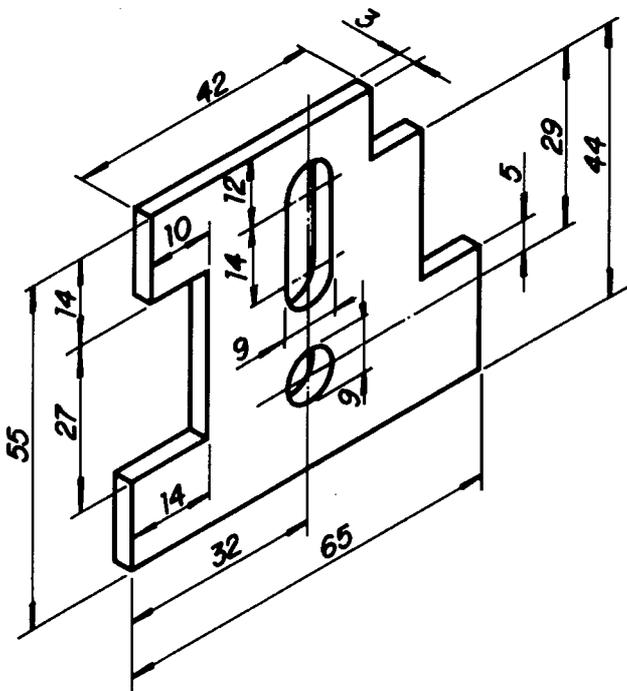


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - E.

Analise as perspectivas e coloque as cotas nas projeções.

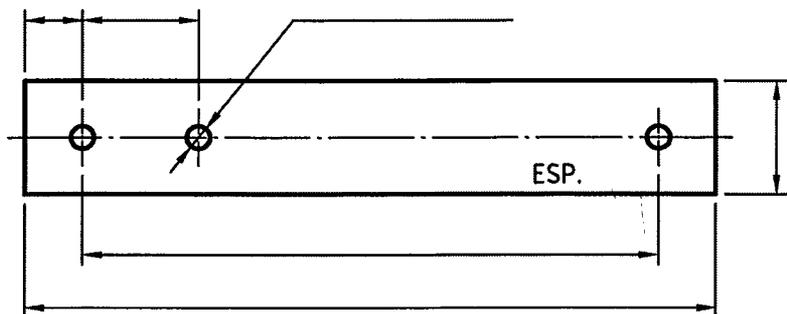
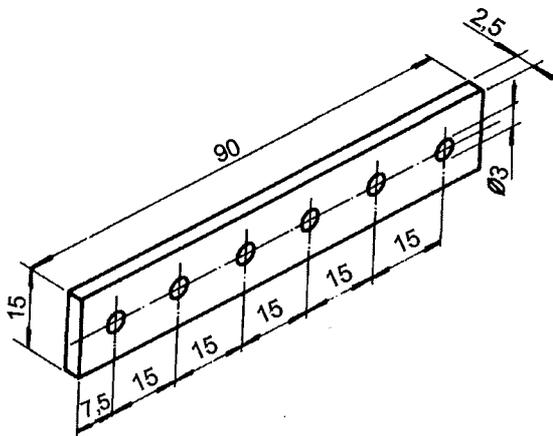
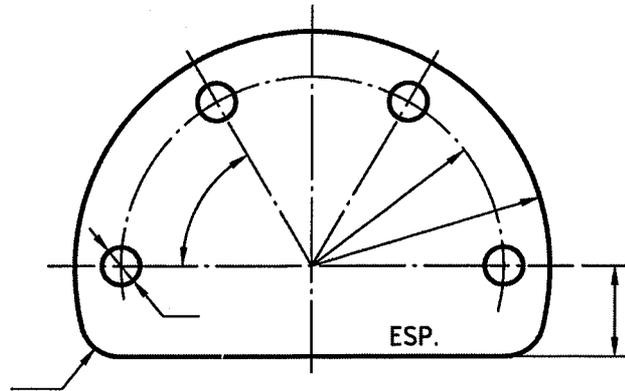
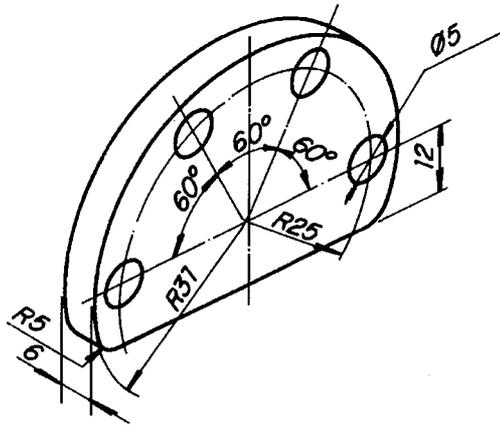


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Distribuir cotas em projeções, observando perspectivas - F.

Observe as perspectivas e escreva as cotas nas projeções.

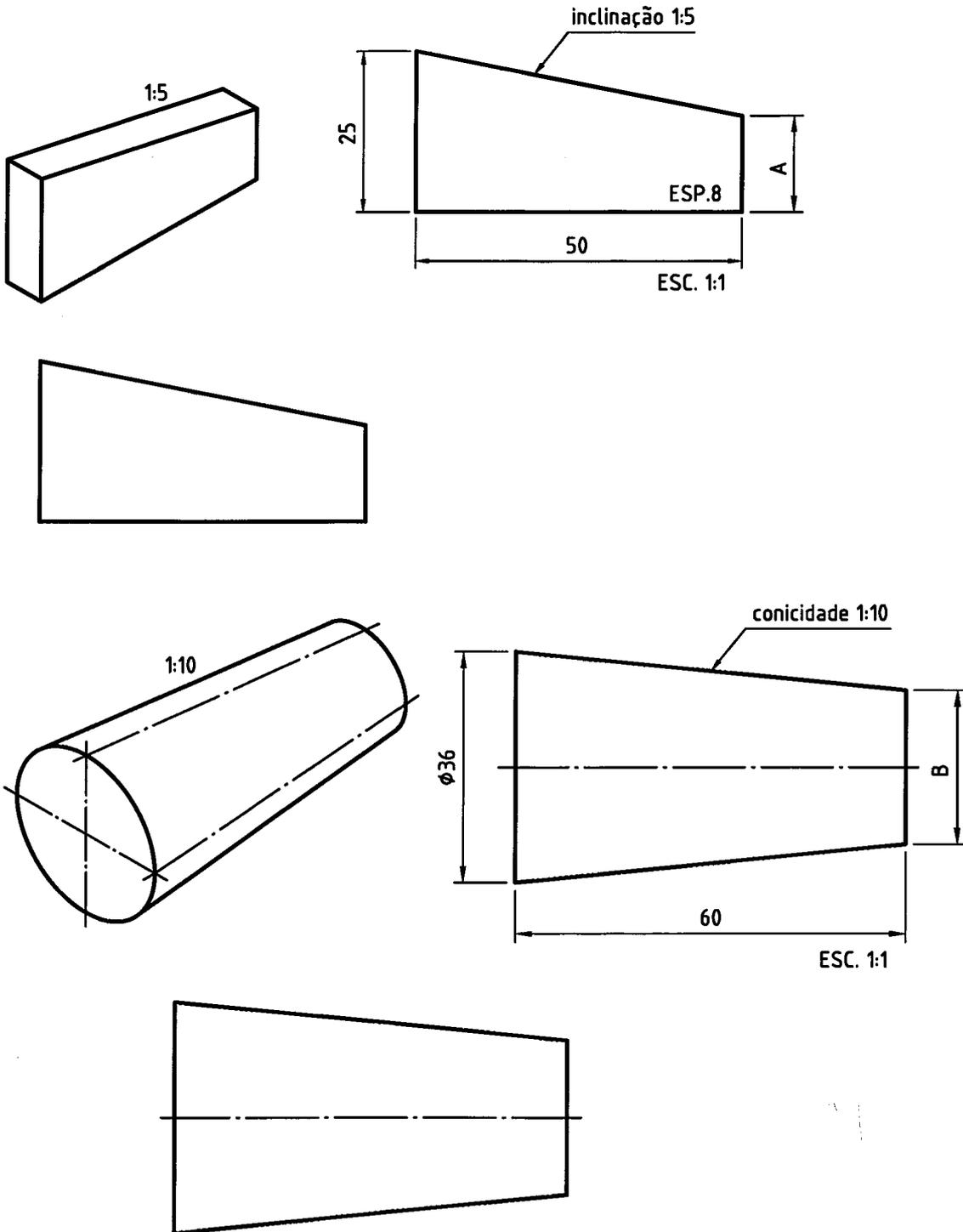


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Cotagem - Cotar elementos.

Nas projeções apresentadas, faça somente a cotagem dos elementos citados.



CAPÍTULO 5

Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Determine o ponto de fuga na figura abaixo.

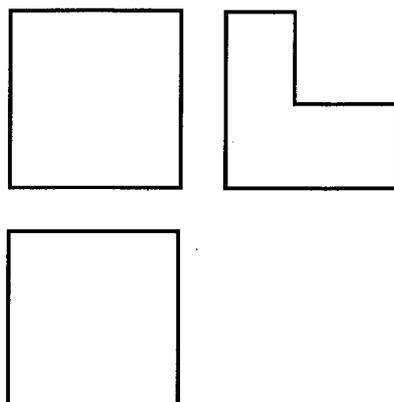
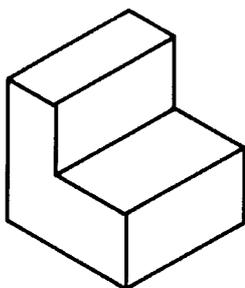
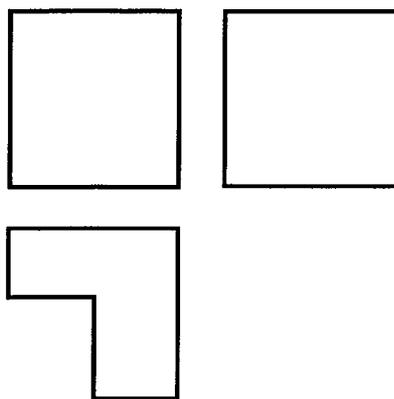
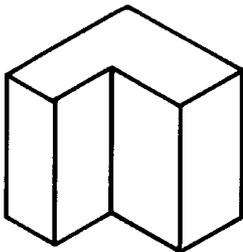
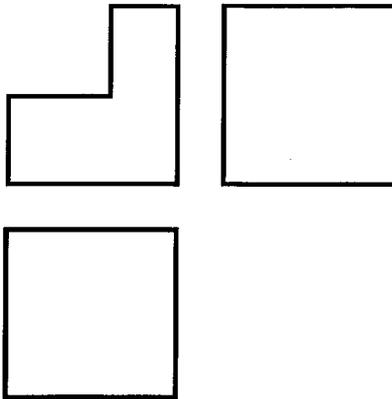
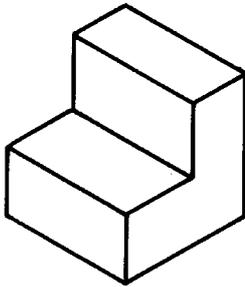


Encontrar figuras, em jornal, revista ou na web, que representem perspectivas do tipo:

- Cônica. Encontre o(s) ponto(s) de fuga e linha do horizonte.
- Paralela. Identifique o tipo e justifique.

Projeção ortogonal - Completar desenhos de modelos com detalhes paralelos - A.

Complete as projeções.

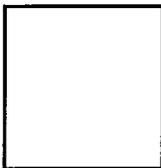
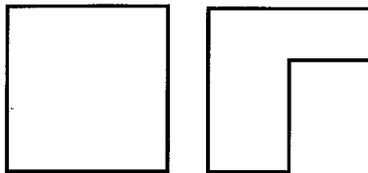
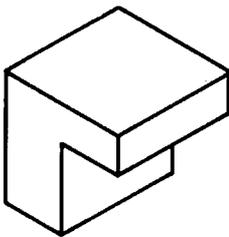
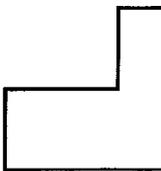
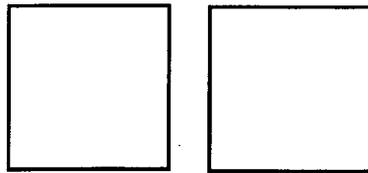
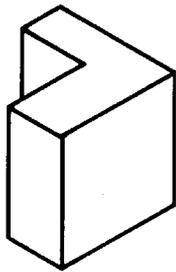
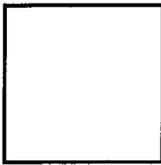
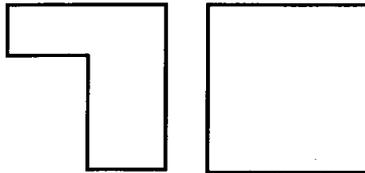
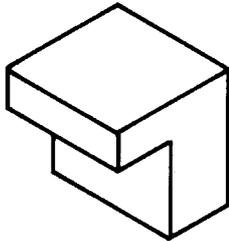


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

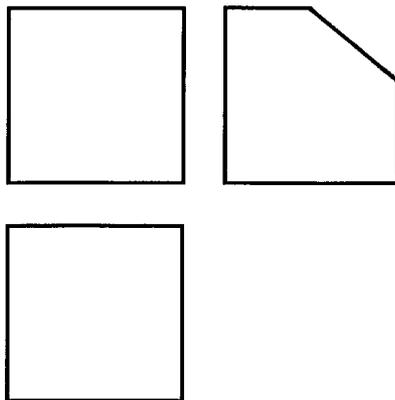
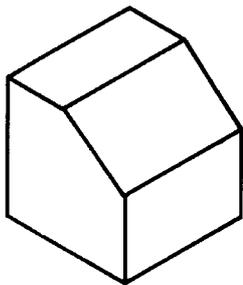
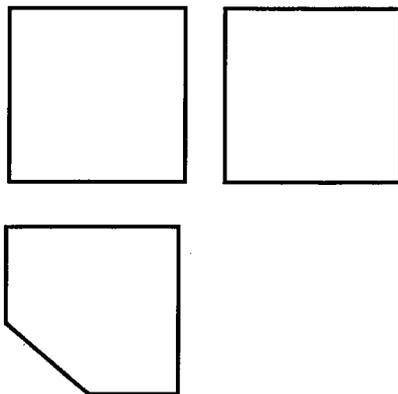
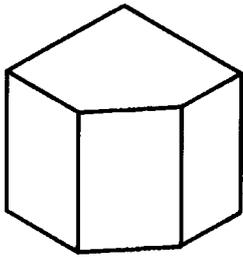
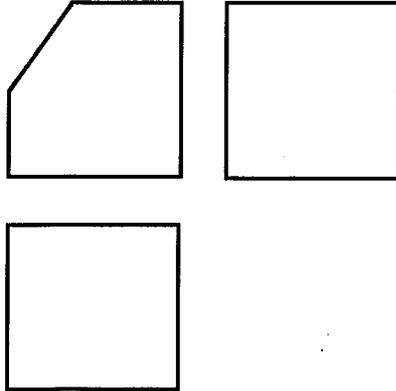
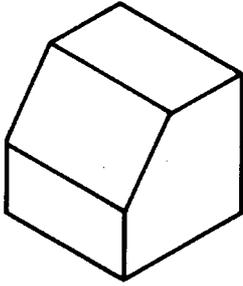
Projeção ortogonal - Completar desenhos de modelos com detalhes paralelos - B.

Complete as projeções.



Projeção ortogonal - Completar desenhos de modelos com detalhes oblíquos.

Complete as projeções.

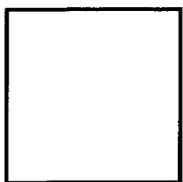
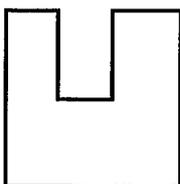
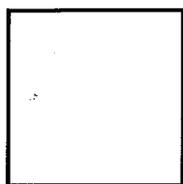
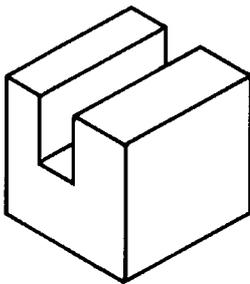
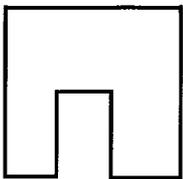
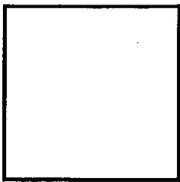
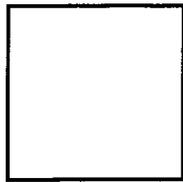
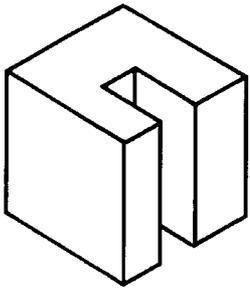
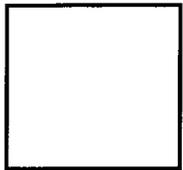
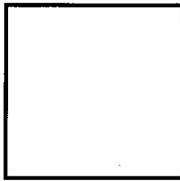
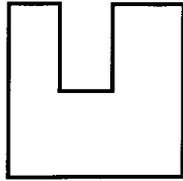
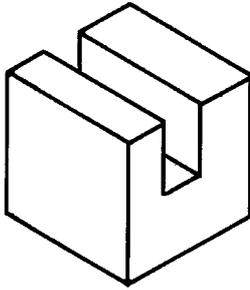


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

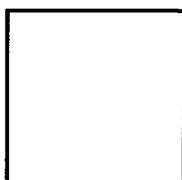
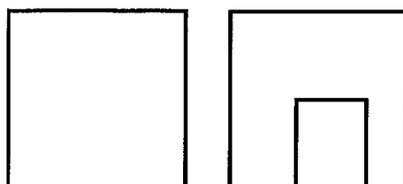
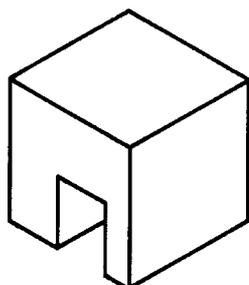
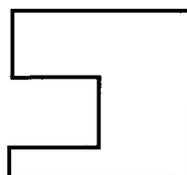
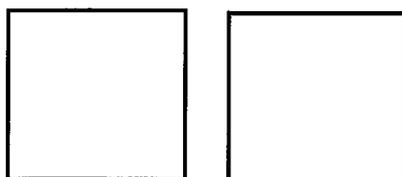
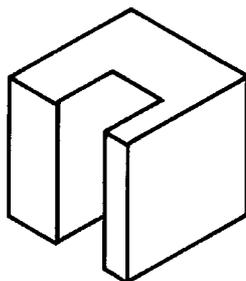
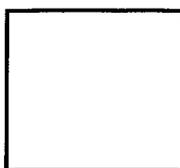
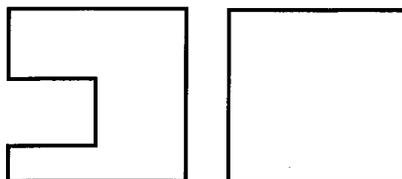
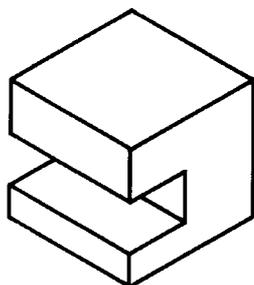
Projeção ortogonal - Completar desenhos de modelos com detalhes não-visíveis - A.

Complete as projeções.



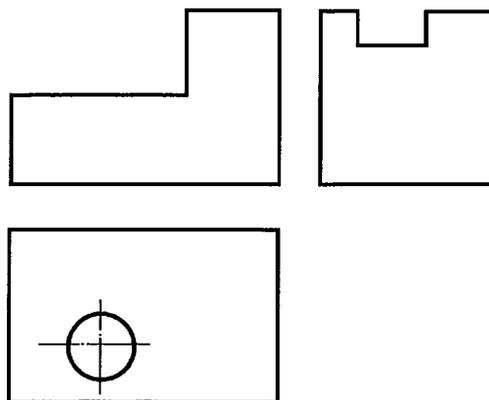
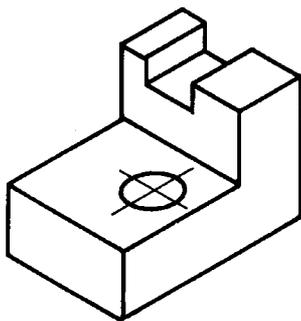
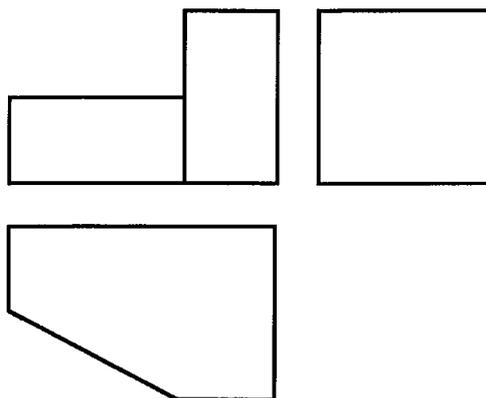
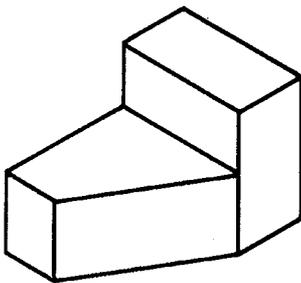
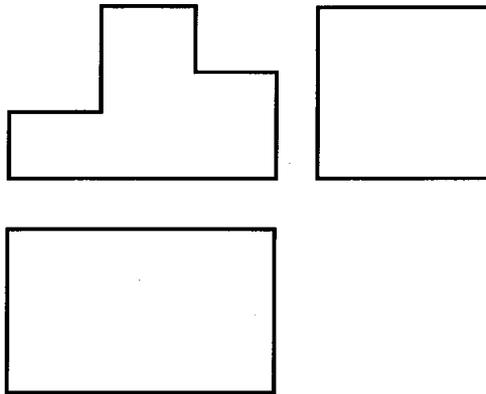
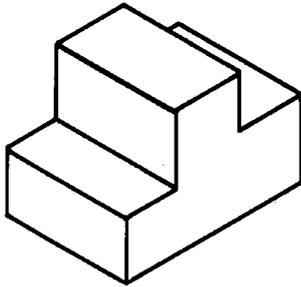
Projeção ortogonal - Completar desenhos de modelos com detalhes não-visíveis - B.

Complete as projeções.



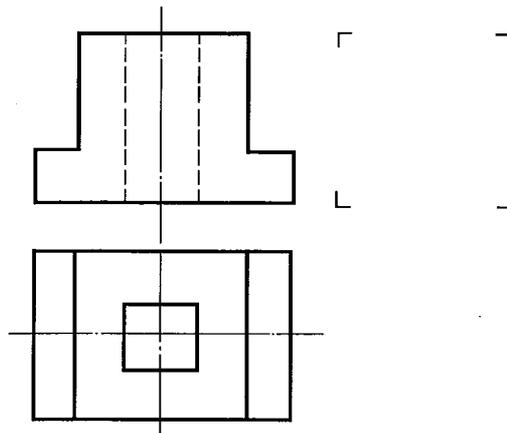
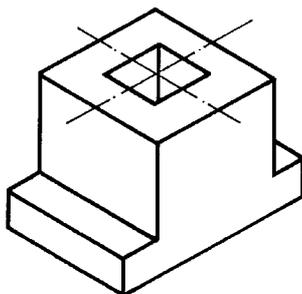
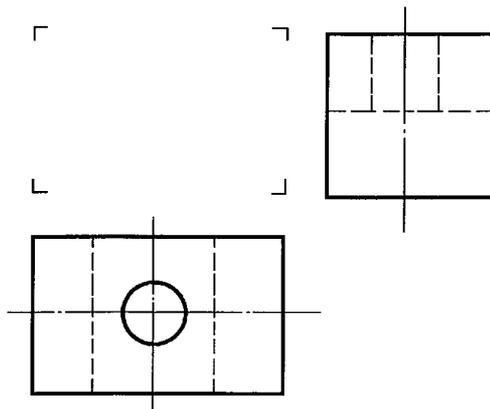
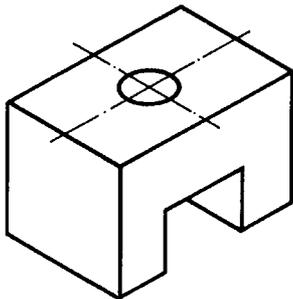
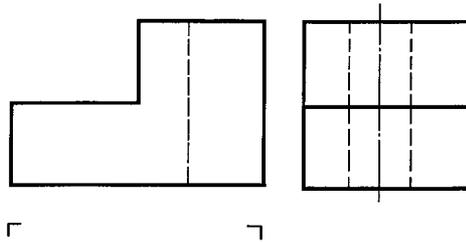
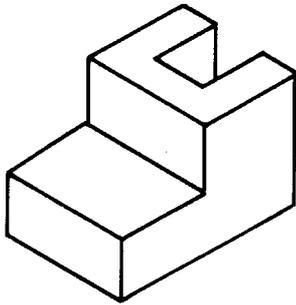
Projeção ortogonal - Completar desenhos de modelos com detalhes variados - A.

Complete as projeções.



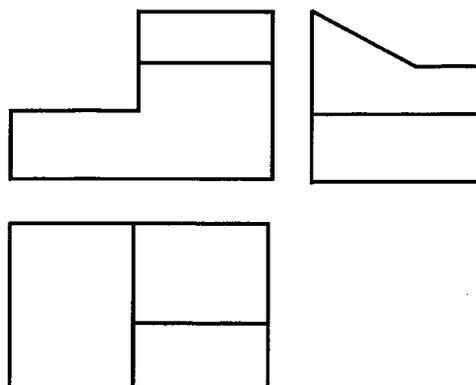
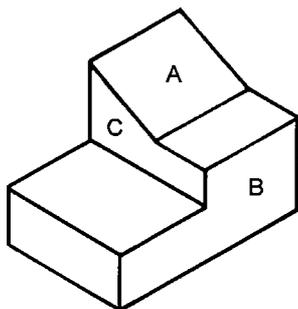
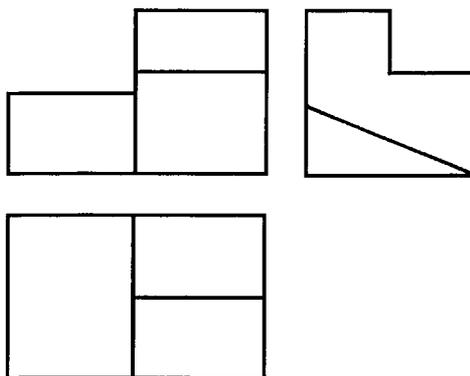
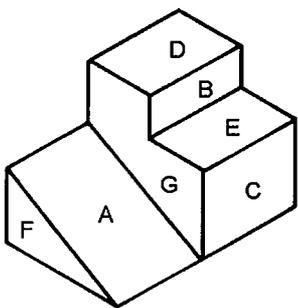
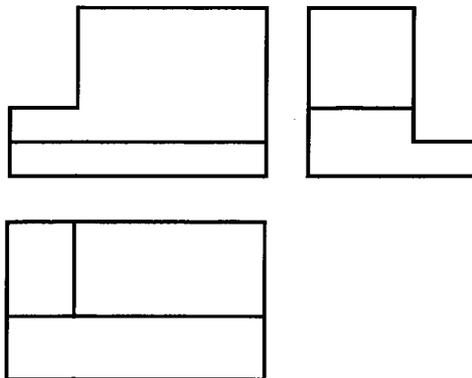
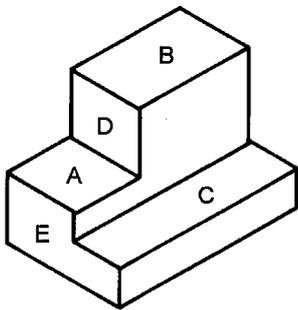
Projeção ortogonal - Completar desenhos de vistas que faltam.

Desenhe a vista que falta.



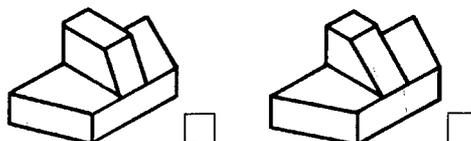
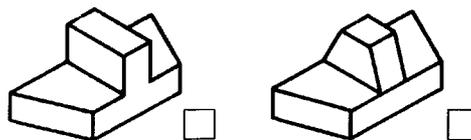
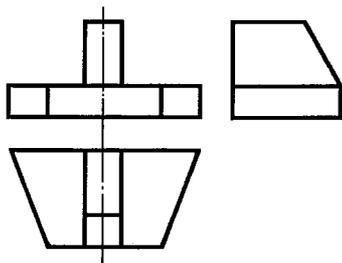
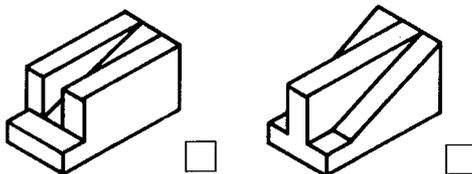
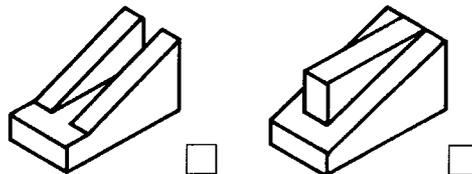
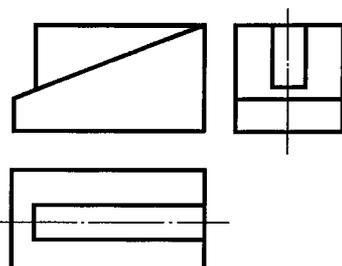
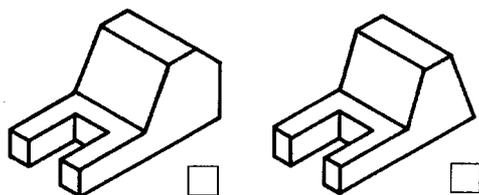
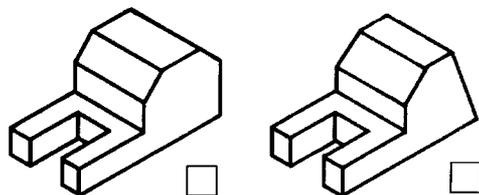
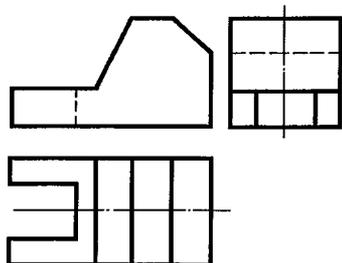
Projeção ortogonal - Identificar faces em projeções - B.

Escreva nas vistas dos desenhos técnicos as letras dos modelos representados em perspectiva isométrica que correspondem às suas faces.



Projeção ortogonal - Identificar perspectiva com base em projeções – A.

Para cada peça em projeção há quatro perspectivas, porém só uma é correta. Assinale com **X** a perspectiva que corresponde à peça.

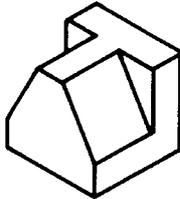
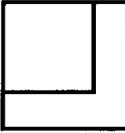
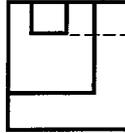
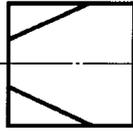
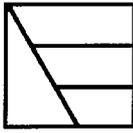
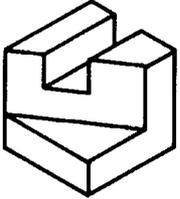
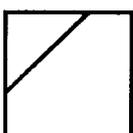
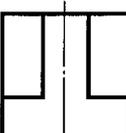
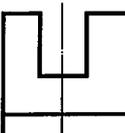
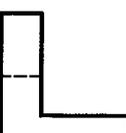
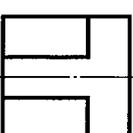
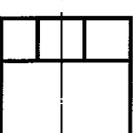
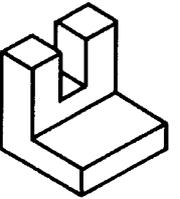
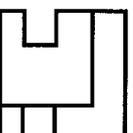
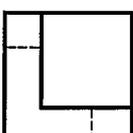
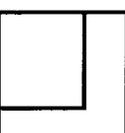
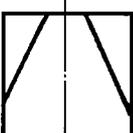
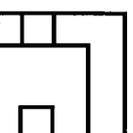
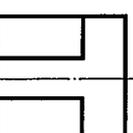
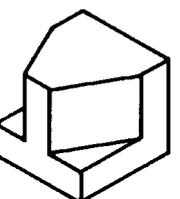
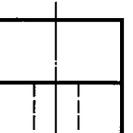
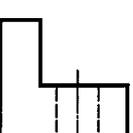
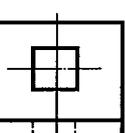
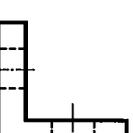
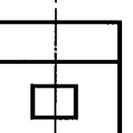
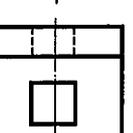
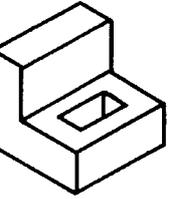


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Projeção ortogonal - Relacionar projeções e perspectiva - A.

Anote embaixo de cada perspectiva o número correspondente às suas projeções.

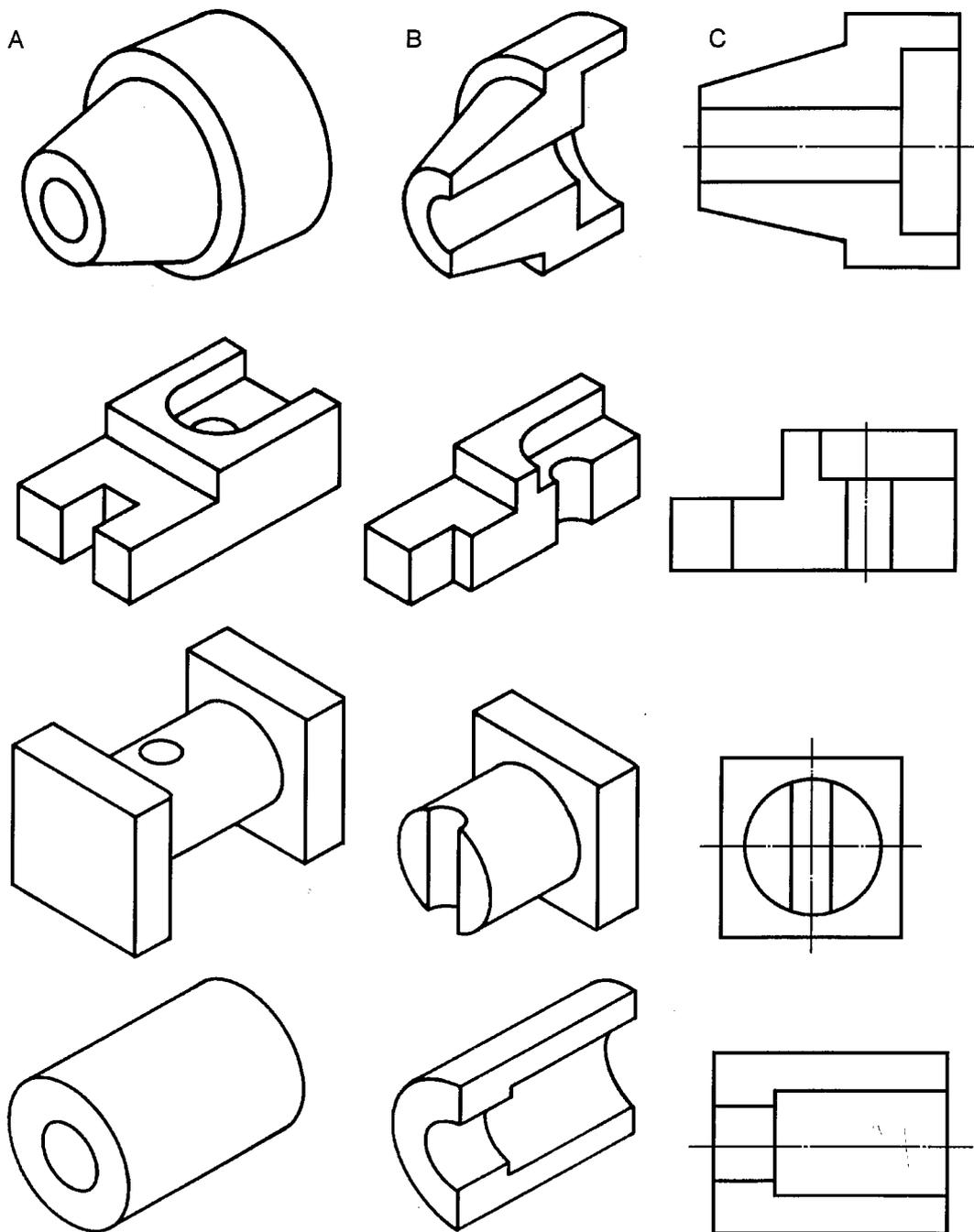
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		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>				
			<input type="checkbox"/>		<input type="checkbox"/>

Desenho em corte - Sombrear perspectivas e hachurar projeções.

Coluna A - As peças estão representadas em perspectiva.

Coluna B - Faça o sombreado das partes atingidas pelo corte.

Coluna C - Faça o hachurado à mão livre.

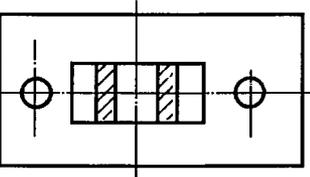
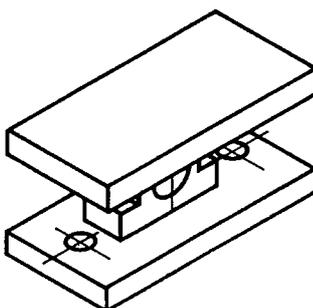
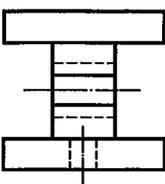
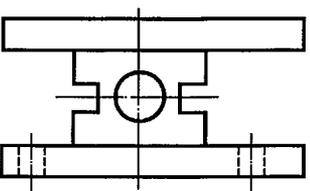
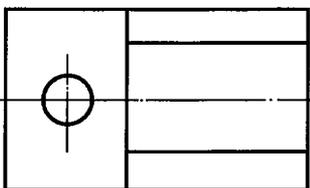
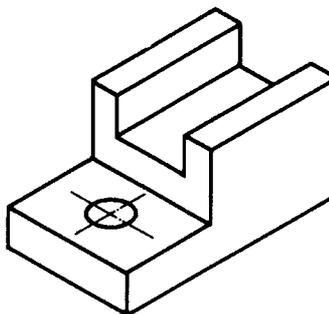
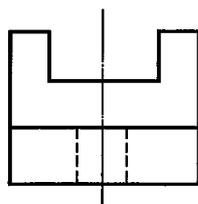
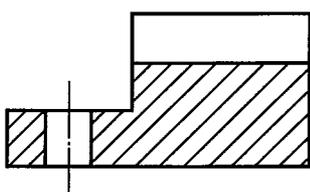
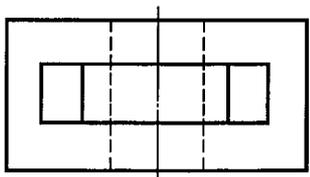
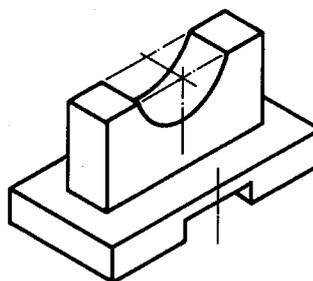
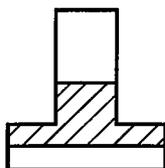
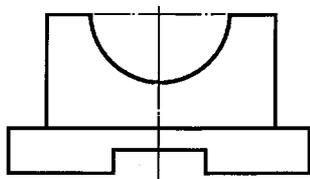


Desenho
Exercícios

Nome _____
Nº _____ Turma _____

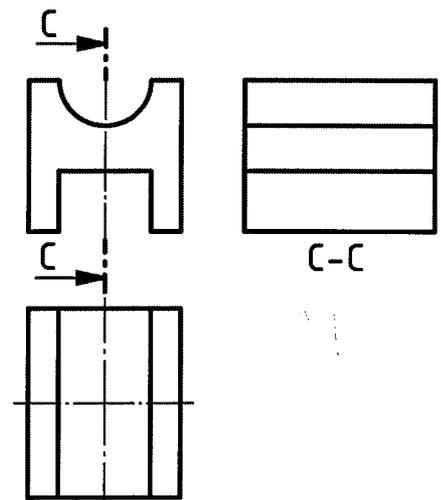
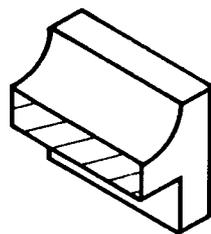
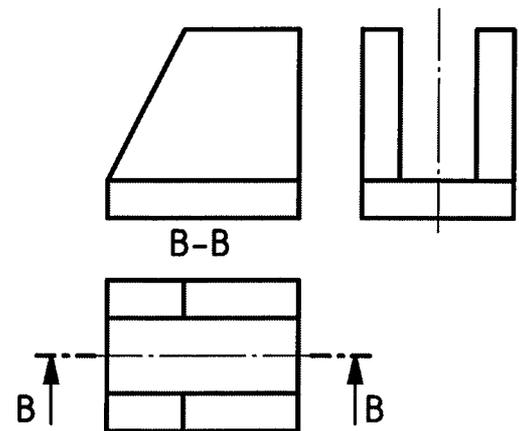
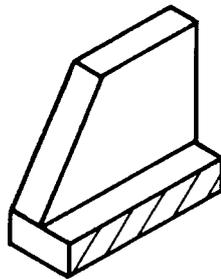
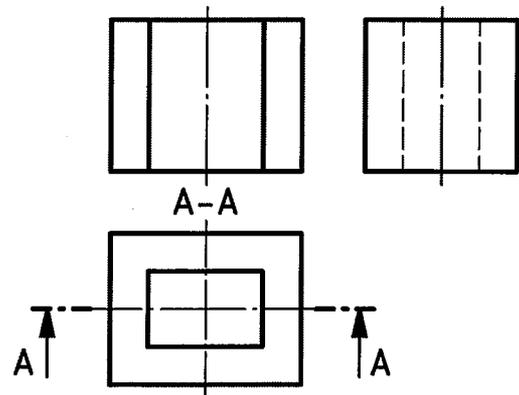
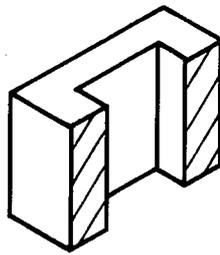
Desenho em corte - Indicar cortes.

Indique os cortes nos desenhos abaixo.



Desenho em corte - Hachurar vistas, analisando perspectivas.

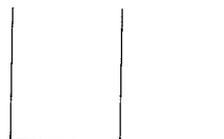
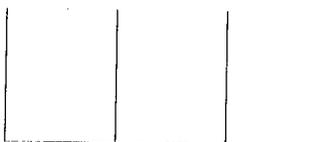
Analise as perspectivas em corte e faça hachuras nos desenhos técnicos, indicando as partes maciças atingidas pelo corte.



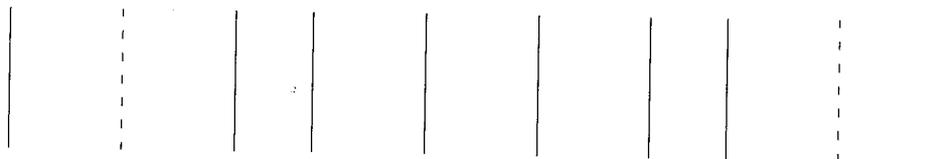
Desenhe a vista faltante e representa a perspectiva isométrica e cavaleira de cada uma das peças a seguir, na escala 1:1.



Peça 1



Peça 2



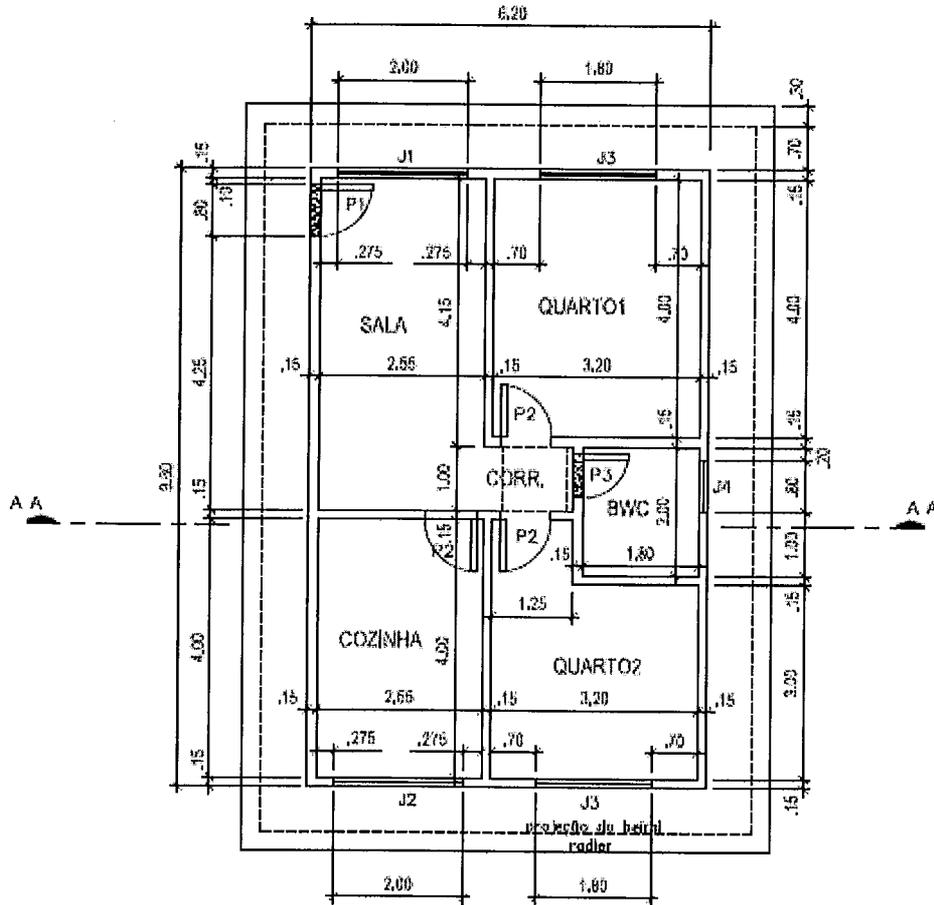
Peça 3

CAPÍTULO 6

Desenho
Exercícios

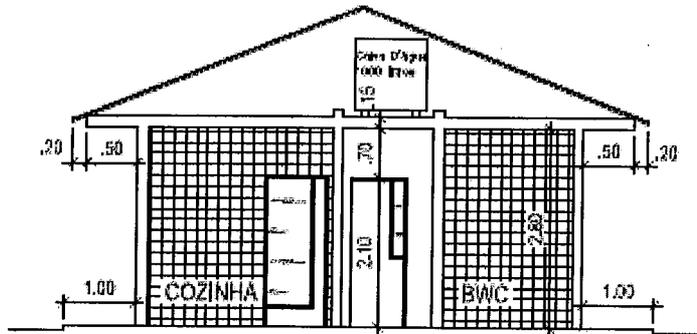
Nome _____
Nº _____ Turma _____

Represente a planta baixa, corte longitudinal, transversal e fachada da planta apresentada abaixo. Escala 1:100. Papel A4. Indicar margem e legenda. Não esqueça de cotar o desenho.



PLANTA BAIXA

ESCALA: 1:100



CORTE AA

ESCALA: 1:100

QUADRO DE ESQUADRIAS						
PORTAS						
	QTDE	TIPO	DIMENSÕES	ÁREA	MATERIAL	E.L.
P1	1	arco	0,80x2,10	1,68	madeira	ext.
P2	3	arco	0,80x2,10	1,68	madeira	int.
P3	1	arco	0,70x2,10	1,47	madeira	int.
JANELAS						
	QTDE	TIPO	DIMENSÕES	ÁREA	MATERIAL	VIDRO
J1	1	correr	2,00x2,20	4,40	aco	liso
J2	1	correr	2,00x1,50	3,00	aco	liso
J3	2	correr	1,50x1,50	2,70	aco	liso
J4	1	basec.	0,80x0,80	0,64	aco	fant.

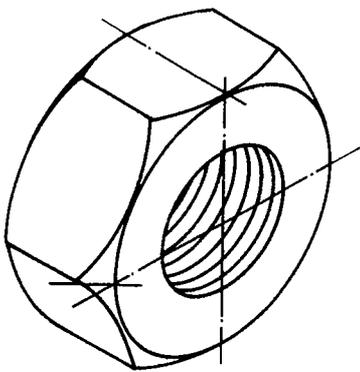
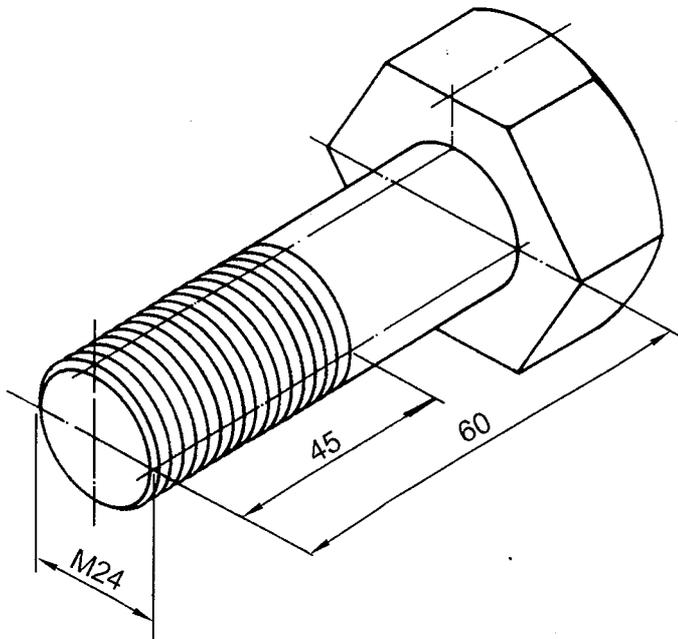
CAPÍTULO 7

Desenho I
Exercícios

Nome _____
Nº _____ Turma _____

Roscas

Desenhe em folha A4 as projeções do parafuso e da porca.



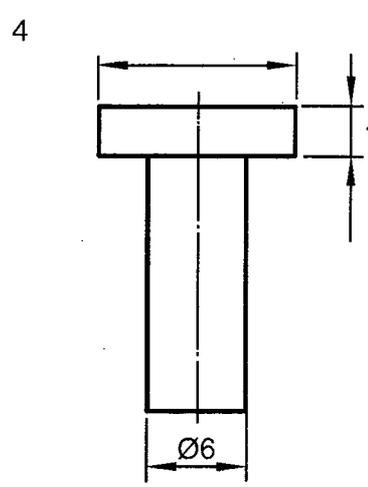
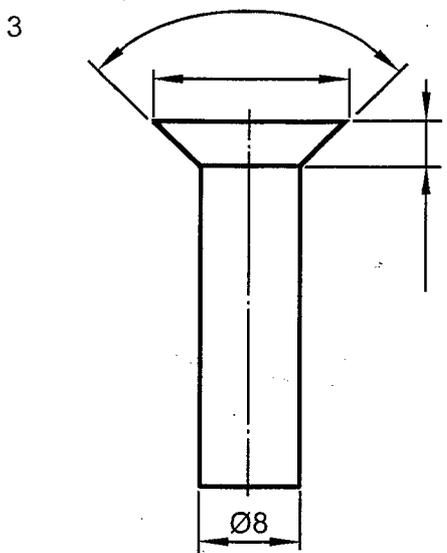
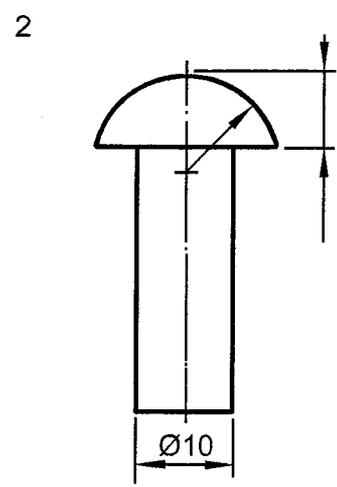
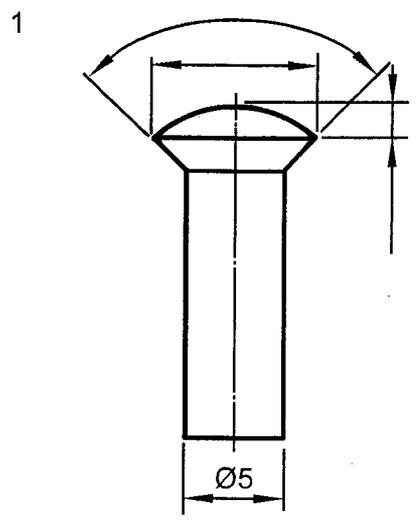
Porca M24

Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Rebites

Escreva as cotas conforme as proporções.



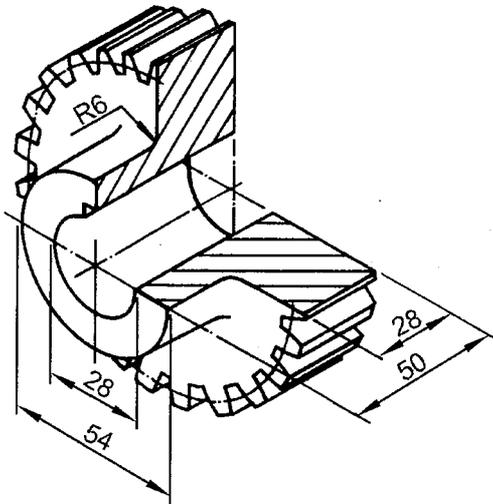
Desenho
Exercícios

Nome _____
Nº _____ Turma _____

Desenho de detalhes e de montagem: dispositivo de transmissão (engrenagem, chaveta meia-cana, arruela e porca sextavada).

Faça o desenho dos detalhes do dispositivo de transmissão.

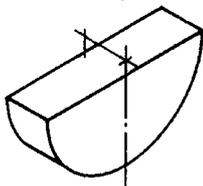
Peça 5 - Engrenagem



5

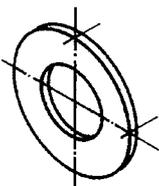
$M = 4$
 $N = 24$
 $D_e = 104$
 $D_p = 96$
 $D_i = 86,6$

Peça 6 - Chaveta meia-cana



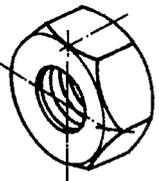
6

Peça 7 - Arruela



7

Peças 8 e 9 - Porca sextavada



8 9

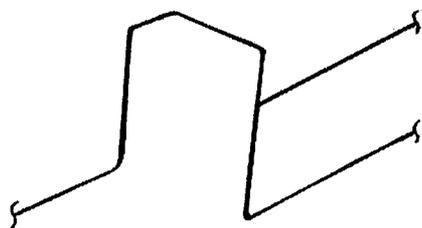
CAPÍTULO 8

Desenho
Exercícios

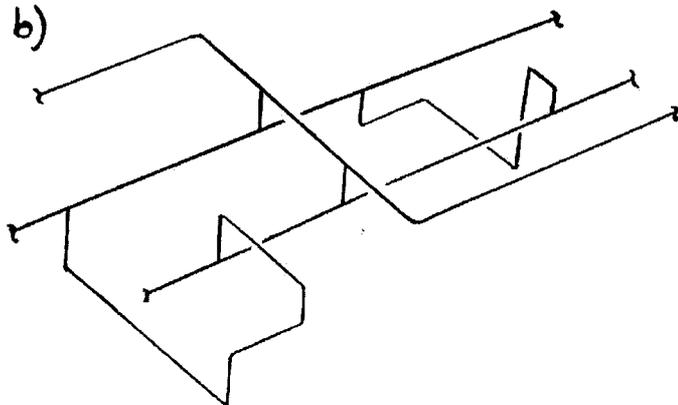
Nome _____
Nº _____ Turma _____

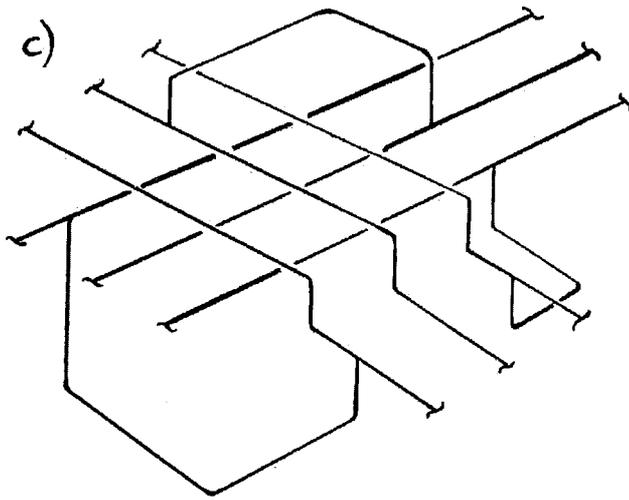
Desenhar as vistas lateral esquerda (LES), elevação (EL) e planta (PL) de cada um dos isométricos de tubulação descritos abaixo.

a)



b)





Desenhar a isométrica da tubulação na escala 1:50.

