**Nome:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ No Usp \_\_\_\_\_\_\_\_\_\_\_\_\_**

**ATENÇÃO: Responda apenas no espaço designado. Não será considerado o que for escrito fora das linhas especificamente designadas para a resposta, por isso elabore sua resposta de modo a não exceder este espaço.**

Ao longo da prova, será considerado o modelo:

y = a + bx +ε

ε | X ~ N(0, σ)

No final da prova há uma tabela com valores críticos de uma distribuição normal-padrão e a fórmula da distribuição normal, para ajuda-la(o) se necessário.

1. (2 pontos) Monte o problema de minimização de uma função-perda absoluta: L(ε) = | ε| (monte apenas o problema de minimização com a contrapartida amostral. Não precisa resolvê-lo)

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1. (2 pontos) Qual a função de verossimilhança do problema acima?

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1. (4 pontos) Suponha que e que .
	1. Qual o valor de  em uma amostra de tamanho 16?

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* 1. Qual é a distribuição de (Dica: é uma distribuição normal, e seu trabalho é apenas o de encontrar E() e Var(). indique sua resposta como função de b e σ2)?

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* 1. Sendo uma variável normal não-padrão, como posso obter uma variável aleatória normal-padrão (chame-a de z) a partir de ?

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* 1. Se eu soubesse que σ = 2, como eu poderia testar se b = 0? A 4% de significância eu aceito ou rejeito esta hipótese?

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1. (2 pontos) Explique e interprete o significado da seguinte frase: “Seja uma aproximação do efeito de um desvio da média de x sobre uma variável de resultado, y, para o indivíduo *i*. O cômputo de pode ser visto como uma média ponderada de para diferentes indivíduos, com peso maior para indivíduos cujo valor de x mais se distancie de ”.

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1. **(1,5 ponto) Bônus**:
	1. Determine o suporte das seguintes variáveis aleatórias:
		1. Salários recebidos pelas pessoas ocupadas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		2. Resultados do lançamento de um dado \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		3. Logaritmo do salário recebido pelas pessoas ocupadas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Como sua resposta ao item 3.4. mudaria se você não conhecesse σ2, mas a tivesse estimado como S2 = 2?

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* 1. Quais as possíveis interpretações para ε em um modelo como o enunciado no início deste exame?

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**Função Densidade de Probabilidade Normal:**

1. **Univariada: **
2. **Multivariada:** 