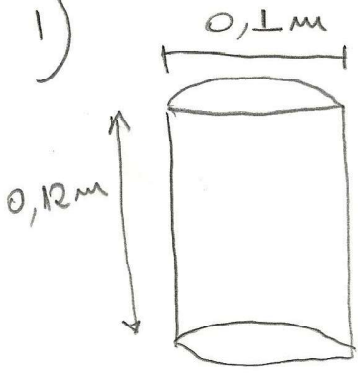
# Dicas Lista Umidade do solo

(1)

1)




$m = 1,7\ kg$

$ma = 0,26\ kg$

$\rho_s = 2650\ kg/m^3$

a) $U = \frac{ma}{ms}$ ← já tenho

$ms \rightarrow m = ma + ms$

$ms = m - ma$

b) $\theta = \frac{Va}{V}$ ← em $m^3$

$V \rightarrow \frac{\pi d^2}{4} \cdot h$ (do anel) $\rightarrow 9,42 \cdot 10^{-4}\ m^3$

$1\ m^3$ água $- 1000\ kg - 1000\ L$

$X - 0,26\ kg$ → $0,26\ kg / 1000$

c) $h = \theta \cdot Z$ ← h do cilindro (resultado em m, $\times 1000 = mm$)

d) $d = \frac{ms}{V} = 1528,66\ kg/m^3$ ou $1,528\ g/cm^3$

e) $\alpha = \left(1 - \frac{d}{\rho_s}\right) = \left(1 - \frac{1528,66}{2650}\right) =$

2) $m = 220\ kg \quad U = 0,18\ kg/kg$

$ms = ? \quad ma = ?$

$m = ma + ms \qquad U = \frac{ma}{ms} \Rightarrow 0,18 = \frac{ma}{ms} \Rightarrow ma = 0,18\,ms$

$220 = 0,18\,ms + ms$ | Resolução da equação

3) $Z = 0,8\ m \quad \theta_1 = 0,13\ m^3 água / m^3 solo \quad \theta_2 = 0,3\ m^3/m^3$

$h = (\theta \cdot Z) \Rightarrow (\theta_2 - \theta_1) \cdot Z = \_\_\_\_ m \times 1000 = \_\_\_\_ mm$

4) $\theta_1 = 0,1\ m^3/m^3$

$h = 100\ mm$ $\quad \theta_2 = 0,3\ m^3/m^3$ $\quad Z = ?$

(2)

$h = (\theta_2 - \theta_1) \cdot Z$

$0,1\ m = (\theta_2 - \theta_1) \cdot Z \rightarrow 0,5\ m$

5) $h = ?$ $\quad (0,3 - 0,1) \cdot 1,25 = 0,25\ m$

6) $m_s = 0,1\ kg$ $\quad \theta = 0,25\ m^3/m^3$

$m = m_a + m_s$ $\quad d_{solo} = 1200\ kg/m^3 / 1000 \rightarrow$ p/ ponar p/ g

$m = ?$

$U = \frac{m_a}{m_s}$ $\quad \theta = U \cdot d$

$0,25 = U \cdot 1200\ kg/m^3$ solo

$U = 2,083 \cdot 10^{-4}\ \frac{m^3\ água}{kg\ solo\ seco}$

$0,2083 = \frac{m_a}{0,1}$

$m_a = 0,02083 + 0,1$

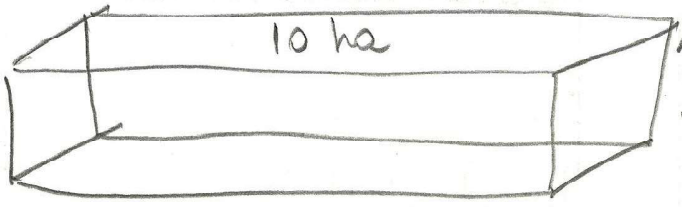
$0,12083\ kg$

ponar p/ kg/kg $\cdot$ / 1000 =

$1\ m^3 \rightarrow 1000\ kg$

$2,083 \cdot 10^{-4} \rightarrow X \quad X = 0,2083\ \frac{kg\ H_2O}{kg\ solo}$

7)




$10\ ha = 100\,000\ m^2$

$V = 30\,000\ m^3$

$m_s = ?$

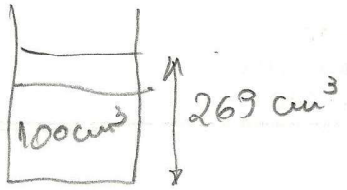
Livros = ?

$U = 0,2\ \frac{kg\ água}{kg\ solo}$ $\quad U = \frac{m_a}{m_s}$

$\rho = 1700\ \frac{kg\ solo}{m^3\ solo}$ $\left(\frac{m_s}{V}\right)$ $\quad 1700 = \frac{m_s}{V}$

$m_s$ em kg $\quad 0,2 = \frac{m_a}{m_s}$ $\quad m_a$ em kg

10)




$$d_s = \frac{m_s}{V_s} = \frac{P_s}{V_s} = \frac{458}{(269-100)} = 2,71 \text{ g/cm}^3$$

4

11) Porosidade total ($\alpha$) $\alpha = \left(1 - \frac{1,38}{2,71}\right) = 49,08\%$

" Livre de água $= \alpha - \theta = 0,4908 - 0,3078 = 0,183$ $18,3\%$

saturação relativa $= \frac{30,78\%}{49,08\%} = 62,71\%$

Na lista 2 resposta está errada.

12) $V = 200 \text{ cm}^3$ $z = 10 \text{ cm}$

| | ① | ② |
|---|---|---|
| | $m = 332 \text{ g}$ | $m = 360 \text{ g}$ |
| | $m_s = 281 \text{ g}$ | $m_s = 305 \text{ g}$ |
| $d = \frac{m_s}{V}$ | $1,405 \text{ g/cm}^3$ | $1,525 \text{ g/cm}^3$ |
| $m_a = m - m_s$ → $U = \frac{m_a}{m_s}$ | $18,15\%$ | $18,03\%$ |
| $\theta = \frac{V_a}{V}$ | $25,5\%$ | $27,5\%$ |
| $\alpha = 1 - \frac{d}{d_p}$ | $47,36\%$ | $43,52\%$ |

$d_p$ → 2,7

13)


$h = \theta \cdot z = 0,383 \cdot 60 = 22,98 \text{ cm}$ ou $229,8 \text{ mm}$