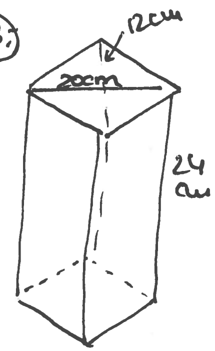
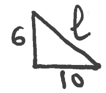
53.-

a)





$a^2 = b^2 + c^2$

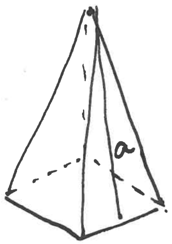
$l^2 = 6^2 + 10^2$

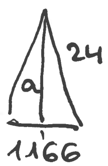
$l = 11'66\,cm$

$A = A_L + 2A_B = P_B \cdot h + \cancel{2} \cdot \frac{D \cdot d}{\cancel{2}} =$

$= 4 \cdot 11'66 \cdot 24 + 20 \cdot 12 = \boxed{1359'54\ cm^2}$

b)



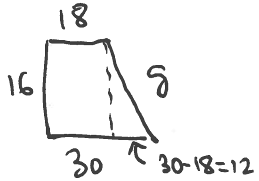


$a = \sqrt{24^2 - 5'83^2} = 23'28\,cm$

$A = A_L + A_B = \frac{P_B \cdot a}{2} + \frac{D \cdot d}{2} =$

$= \frac{4 \cdot 11'66 \cdot 23'28}{2} + \frac{20 \cdot 12}{2} = \boxed{662'9\ cm^2}$

56.-



$a^2 = b^2 + c^2$

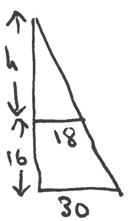
$g^2 = 16^2 + 12^2$

$g = 20\,cm$

$A = A_L + A_B + A_b = \pi(R+r)g + \pi R^2 + \pi r^2 =$

$= \pi(30+18) \cdot 20 + \pi \cdot 30^2 + \pi \cdot 18^2 = 2184\pi =$

$= \boxed{6861'24\ cm^2}$



$\frac{h}{h+16} = \frac{18}{30} \Rightarrow 30h = 18h + 288 \Rightarrow h = 24\,cm$

$H = 40\,cm$

$V_{\substack{tronco\\cono}} = V_{\substack{cono\\grande}} - V_{\substack{cono\\pequeño}} =$

$= \frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(30^2 \cdot 40 - 18^2 \cdot 24) = 9408\pi =$

$= \boxed{29556'1\ cm^3 = 29'556\ l}$

81.- $A_{cubo} = 6a^2 = 216 \Rightarrow a^2 = 36 \Rightarrow a = 6\,cm \Rightarrow V_{cubo} = a^3 = 6^3 = 216\ cm^3$

$A_{esfera} = 4\pi r^2 = 216 \Rightarrow r = \sqrt{\frac{216}{4\pi}} = 4'15\,cm$

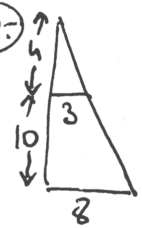
$V_{esfera} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 4'15^3 = 298'5\,cm^3$

3º ESO

Tiene más volumen la esfera.

85.- $A_L = \frac{P_B \cdot a}{2} = 80 \Rightarrow \frac{32a}{2} = 80 \Rightarrow \boxed{a = \frac{80 \cdot 2}{32} = 5cm}$

60.-

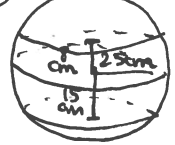


$\frac{h}{h+10} = \frac{3}{8} \Rightarrow 8h = 3h + 30 \Rightarrow h = 6\,cm \Rightarrow H = 16\,cm$

$V_{\substack{tronco\\pirámide}} = V_{\substack{pirámide\\grande}} - V_{\substack{pirámide\\pequeña}} =$

$= \frac{1}{3}A_B \cdot H - \frac{1}{3}A_b \cdot h = \frac{1}{3}(16^2 \cdot 16 - 6^2 \cdot 6) = \boxed{1293'33\ cm^3}$

76.-



$A_{zona\ esférica} = 2\pi r h = 2\pi \cdot 25 \cdot 23 = 1150\pi =$

$= \boxed{3612'83\,cm^2}$

82.- a) $V = V_{ortoedro} + V_{pirámide} = abc + \frac{A_B \cdot h}{3} = 4 \cdot 2 \cdot 2 + \frac{2^2 \cdot 2}{3} =$

$= \boxed{18'67\,cm^3}$

b) $V = V_{cilindro} + V_{cono} = \pi r^2 h + \frac{\pi r^2 h}{3} =$

$= \pi \cdot 3^2 \cdot 4 + \frac{\pi \cdot 3^2 \cdot 4}{3} = 48\pi = \boxed{150'8\,cm^3}$

c) $V = V_{cilindro} - V_{cono} = \pi r^2 h - \frac{\pi r^2 h'}{3} = \pi \cdot 4^2 \cdot 8 - \frac{\pi \cdot 4^2 \cdot 4}{3} = \boxed{335'1\,cm^3}$

d) $V = V_{\substack{cubo\\grande}} - 8 \cdot V_{\substack{cubo\\pequeño}} = 9^3 - 8 \cdot 3^3 = \boxed{513\,cm^3}$

e) $V = \frac{V_{cilindro} + V_{cono}}{2} = \frac{1}{2}\left(\pi \cdot 1'5^2 \cdot 5 + \frac{\pi \cdot 1'5^2 \cdot 5}{3}\right) = 7'5\pi = \boxed{23'56\,cm^3}$

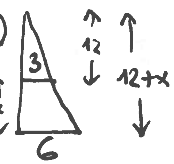
f) $V = V_{cubo} - V_{pirámide} = 6^3 - \frac{6^2 \cdot 4}{3} = \boxed{168\,cm^3}$

g) $V = V_{cubo} - V_{pirámide} = 8^3 - \frac{1}{3} \cdot \frac{4 \cdot 4}{2} \cdot 4 = \boxed{501'33\ cm^3}$

(Pirámide triangular de base un triángulo rectángulo de catetos de 4cm)

h) $V = V_{\substack{media\\esfera}} + V_{cilindro} = \frac{4}{3}\pi r^3 + \pi r^2 h = \frac{4}{3}\pi \cdot 6^3 + \pi \cdot 6^2 \cdot 7 = 540\pi = \boxed{1696'46\ cm^3}$

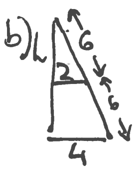
83.- a)



$\frac{12}{12+x} = \frac{3}{6} \Rightarrow 72 = 36 + 3x \Rightarrow x = 12 \Rightarrow H = 24\ cm$

$V = \frac{1}{3} A_B H - \frac{1}{3} A_b \cdot h = \frac{1}{3}(12^2 \cdot 24 - 6^2 \cdot 12) = \boxed{1008\ cm^3}$

b)



$h^2 + 2^2 = 6^2$

$h = 5'66\ cm$

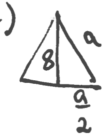
$H = 11'32\ cm$

$V = \frac{1}{3}\pi (R^2 H - r^2 h) = \frac{1}{3}\pi (4^2 \cdot 11'32 - 2^2 \cdot 5'66) = \boxed{165'96\ cm^3}$

c) $5 = \sqrt{a^2 + a^2 + a^2} \Rightarrow 5 = \sqrt{3a^2} \Rightarrow 5 = a\sqrt{3} \Rightarrow a = \frac{5}{\sqrt{3}} = 2'9\ cm$

$V = a^3 = 2'9^3 = \boxed{24'06\ cm^3}$

d)



$a^2 = b^2 + c^2$

$a^2 = 8^2 + \left(\frac{a}{2}\right)^2$

$a^2 = 64 + \frac{a^2}{4} \Rightarrow a^2 - \frac{a^2}{4} = 64 \Rightarrow \frac{3a^2}{4} = 64 \Rightarrow a^2 = \frac{64 \cdot 4}{3} \Rightarrow a = \frac{16}{\sqrt{3}} = 9'24\ cm$

$h = \sqrt{8^2 - \left(\frac{8}{3}\right)^2} = 7'54\ cm$

$A = \frac{1}{3} A_B \cdot h = \frac{1}{3} \cdot \frac{9'24 \cdot 8}{2} \cdot 7'54 = 92'87\ cm^2$

99.- Nuevo envase: $A_B = 66\ cm^2 \rightarrow A'_B = 0'9 \cdot 66 = 59'4\ cm^2$

$h = 15 \rightarrow h' = 1'1 \cdot 15 = 16'5\ cm$

a) $V_{antiguo} = 11 \cdot 6 \cdot 15 = 990\ cm^3 = 0'99\ l$ $\quad V_{nuevo} = A'_B \cdot h' = 59'4 \cdot 16'5 = 980'1\ cm^3 = 0'98\ l$

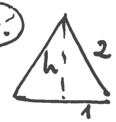
$\boxed{\text{Es menor}}$

b) No, pq pagaría lo mismo por menos

c) Ahora: $(99000 : 0'98) \cdot 1'40€ = 141.428'57€$

Antes: $(99000 : 0'99) \cdot 1'40€ = 140.000€$

93.-



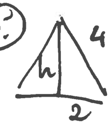
$h = \sqrt{2^2 - 1^2}$

$h = \sqrt{3}$

$A_{cara} = \frac{b \cdot h}{2} = \frac{2 \cdot \sqrt{3}}{2} = \sqrt{3} =$

$A_{tetraedro} = 4 \cdot A_{cara} = 4\sqrt{3} =$

94.-



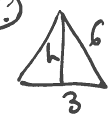
$h = \sqrt{4^2 - 2^2}$

$h = \sqrt{12} = 2\sqrt{3}$

$A_{cara} = \frac{b \cdot h}{2} = \frac{4 \cdot 2\sqrt{3}}{2} = 4\sqrt{3} =$

$A_{octaedro} = 8 \cdot A_{cara} = 8 \cdot 4\sqrt{3} = 32\sqrt{3} =$

95.-



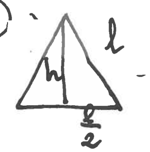
$h = \sqrt{6^2 - 3^2}$

$h = \sqrt{27} = 3\sqrt{3}$

$A_{cara} = \frac{b \cdot h}{2} = \frac{6 \cdot 3\sqrt{3}}{2} = 9\sqrt{3} =$

$A_{icosaedro} = 20 \cdot A_{cara} = 20 \cdot 9\sqrt{3} = 180\sqrt{3} =$

96.-



$l^2 = h^2 + \left(\frac{l}{2}\right)^2 \Rightarrow l^2 = h^2 + \frac{l^2}{4} \Rightarrow l^2 - \frac{l^2}{4} = h^2 \Rightarrow h^2 = \frac{3l^2}{4} \Rightarrow$

$\Rightarrow h = \frac{l}{2}\sqrt{3} \Rightarrow A_{\substack{triángulo\\equilátero}} = \frac{b \cdot h}{2} = \frac{l \cdot \frac{l}{2}\sqrt{3}}{2} = \frac{l^2\sqrt{3}}{4}$

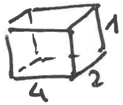
a) $A_\Delta = \frac{16\sqrt{3}}{4} = 4\sqrt{3}$

$\frac{l^2\cancel{\sqrt{3}}}{4} = 4\cancel{\sqrt{3}} \Rightarrow l^2 = 16 \Rightarrow \boxed{l = 4\ cm}$

b) $A_\Delta = \cancel{\sqrt{3}} = \frac{l^2\cancel{\sqrt{3}}}{4} \Rightarrow l^2 = 4 \Rightarrow \boxed{l = 2\ cm}$

c) $A_\Delta = \frac{18\sqrt{3}}{8} = \frac{9\sqrt{3}}{4} \Rightarrow \frac{l^2\sqrt{3}}{4} = \frac{9\sqrt{3}}{4} \Rightarrow l^2 = 9 \Rightarrow \boxed{l = 3cm}$

97.- $\sqrt{21} = \sqrt{x^2 + (4x)^2 + (2x)^2} = \sqrt{21x^2} \Rightarrow x = 1\ cm$



$A = P_B \cdot h + 2 \cdot A_B = 12 \cdot 1 + 2 \cdot 4 \cdot 2 = \boxed{28\ cm^2}$

90.- $V_{cubo} = a^3 = 125 \Rightarrow a = 5\ cm \Rightarrow A_{cubo} = 6a^2 = 6 \cdot 5^2 = 150\ cm^2$

$V_{esfera} = \frac{4}{3}\pi r^3 = 125 \Rightarrow r = \sqrt[3]{\frac{125 \cdot 3}{4\pi}} = 3'1\ cm$

$A_{esfera} = 4\pi r^2 = 4\pi \cdot 3'1^2 = 120'9\ cm^2$

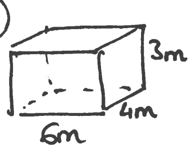
Se necesita menos material con una esfera

91.- $V_{esfera} = \frac{4}{3}\pi r^3 = 2441 6640 \, dm^3 \Rightarrow r = \sqrt[3]{\frac{24416640 \cdot 3}{4\pi}} = 179'97 \, dm$

$A_{esfera} = 4\pi r^2 = 4\pi \cdot 179'97^2 = 407012'791 \, dm^2 = \boxed{4070'13 \, m^2}$

86.- $D = \sqrt{100^2 + 100^2 + 250^2} = 287'23 < 288 \Rightarrow$ NO podemos

87.-



$A = P_B \cdot h + A_B = 20 \cdot 3 + 6 \cdot 4 = 84 \, m^2$

(el suelo no se pinta)

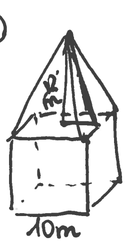
a) Necesitaríamos 3 botes

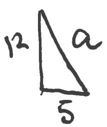
b) $84 : 4 = 21 \, m^2$ cada bote

88.- $a^2 = b^2 + c^2$

$179'37^2 = h^2 + \left(\frac{215'25}{2}\right)^2 \Rightarrow \boxed{h = 143'49 \, m}$

89.-





$a^2 = b^2 + c^2$

$a^2 = 12^2 + 5^2$

$a = 13m$

$A = 5l^2 + \frac{P_B \cdot a}{2} =$

$= 5 \cdot 10^2 + \frac{40 \cdot 13}{2} = \boxed{760 \, m^2}$

101.- $V = V_{cilindro} - V_{esfera} = \pi r^2 h - \frac{4}{3}\pi r^3 = \pi r^2 \cdot 2r - \frac{4}{3}\pi r^3 =$

$= 2\pi r^3 - \frac{4}{3}\pi r^3 = \boxed{\frac{2}{3}\pi r^3}$

110.- $\cancel{2\pi} r H = \cancel{2\pi} R h \Rightarrow 6H = 8h \Rightarrow 6(h+3) = 8h \Rightarrow$

$\Rightarrow 6h + 18 = 8h \Rightarrow h = 9 \, m \Rightarrow H = 12 m$

$A_1^{Total} = 2\pi r H + 2\pi r^2 = 2\pi \cdot 6 \cdot 12 + 2\pi \cdot 6^2 = 216\pi = 678'58 \, m^2$

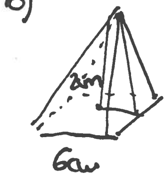
$A_2^{Total} = 2\pi R h + 2\pi R^2 = 2\pi \cdot 8 \cdot 9 + 2\pi \cdot 8^2 = 272\pi = 854'51 \, m^2$

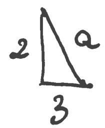
$A_{Lat_1} = 2\pi r H = 2\pi 6 \cdot 12 = 144\pi = 452'39 \, m^2$

$A_{Lat_2} = 2\pi R h = 2\pi \cdot 8 \cdot 9 = 144\pi = 452'39 \, m^2$

100.- a) $(5 \cdot 6 + 3 \cdot 8) \cdot 3^2 = 486 \, cm^2$

b)





$a^2 = b^2 + c^2$

$a^2 = 2^2 + 3^2$

$a = 3'6 cm$

$A = 5 \cdot l^2 + \frac{P_B \cdot a}{2} =$

$= 5 \cdot 6^2 + \frac{24 \cdot 3'6}{2} =$

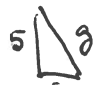
$= 223'27 \, cm^2$

c) $A = 2\pi r^2 + 2\pi r h + \pi r^2 = 2\pi \cdot 6^2 + 2\pi \cdot 6 \cdot 7 + \pi \cdot 6^2 = 192\pi = 603'2 \, cm^2$

d) $A = \frac{1}{2}(A_{L_{cilindro}} + A_{L_{cono}}) + A_{círculo} + A_{rectángulo} =$

$= \frac{1}{2}(2\pi r h + \pi r g) + \pi r^2 + b \cdot a = \frac{1}{2}(2\pi \cdot 1'5 \cdot 5 + \pi \cdot 1'5 \cdot 5'22) +$

$+ \pi \cdot 1'5^2 + 1'5 \cdot 5 = 50'43 \, cm^2$

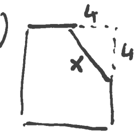


$a^2 = b^2 + c^2$

$g^2 = 5^2 + 1'5^2$

$g = 5'22 \, cm$

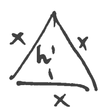
e)



$x^2 = 4^2 + 4^2$

$x = 4\sqrt{2}$

$A_{cara \, ⌂} = 8^2 - \frac{4 \cdot 4}{2} = 56 \, cm^2$



$h^2 + (2\sqrt{2})^2 = (4\sqrt{2})^2$

$h^2 = 32 - 8 = 24$

$h = \sqrt{24} = 4'9 \, cm$

$A_{\Delta} = \frac{4\sqrt{2} \cdot 4'9}{2} = 13'86 \, cm^2$

$A_T = 3 \cdot 56 + 3 \cdot 8^2 + 13'86 = 373'86 \, cm^2$

98.- a) $V = 3^3 - \frac{\pi \cdot 1'5^3 \cdot 4}{3} = 12'86 \, cm^3$

$\frac{12'86}{27} \cdot 100 = 47'64 \%$

b) $V = 3^3 - \pi \cdot 1'5^2 \cdot 3 = 5'79 \, cm^3$ $\quad \frac{5'79}{27} \cdot 100 = 21'44 \%$

c) $V = 3^3 - \frac{1}{3}\pi \, 1'5^2 \cdot 3 = 19'93 \, cm^3$ $\quad \frac{19'93}{27} \cdot 100 = 73'82 \%$