e) Hexaedro irregular

$A_T = A_B \cdot 2 + A_L$

$V = A_B \cdot H$

$A_T = 12 \cdot 2 + 20 \cdot 2 + 15 \cdot 2$

$A_T = 24 + 70 = 94\, cm^2$

$V = 12 \cdot 5 \quad V = 60$

f) cono

teorema pitagoras

$h^2 = c_1^2 + c_2^2$

$8^2 = 4^2 + c_2^2$

$64 = 16 + c^2$

$48 = c^2$ Altura del cono $= \sqrt{48}$ cm

$\sqrt{c^{\cancel{2}}} = \sqrt{48}$

$c = \sqrt{48}$

50,26

Volumen del cono

$V = \frac{\pi \cdot r^2 \cdot h}{3}$

$V = \frac{\pi \cdot 4^2 \cdot \sqrt{48}}{3}$ $V = 115,93\, cm^3$

g) Cono con vertice excentrico

Volumen

$V = \frac{\pi \cdot r^2 \cdot H}{3}$ $V = \frac{\pi \cdot 4^2 \cdot 8}{3}$ $V = 134{,}04 cm^3$

h) cilindro

Volumen $= \pi \cdot r^2 \cdot H$ $V = \pi \cdot 3^2 \cdot 5$ $V = 141{,}37 cm^3$

Area $= 2 \cdot \pi \cdot r \cdot (h+r)$ $A = 2 \cdot \pi \cdot 3 \cdot (5+3)$ $A = 150{,}79 cm^2$

12

Hexaedro regular

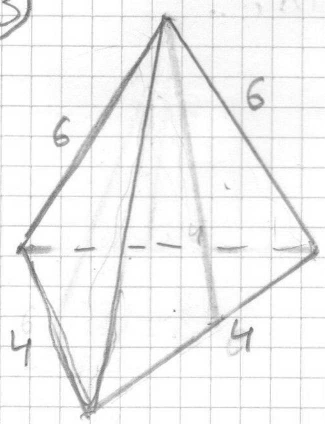
Volumen $= a^3$ $V = 1000 cm^3$

Cono

Volumen $= \frac{\pi \cdot r^2 \cdot h}{3}$ $V = \frac{\pi \cdot 5^2 \cdot 10}{3}$ $V = 261{,}8 cm^3$

$1000 - 261{,}8 = 738{,}2 cm^3$

13



Teorema pitagoras $h^2 = c_1^2 + c_2^2$

$6^2 = 2^2 + c^2$ $32 = c^2$ $\sqrt{c^2} = \sqrt{32}$

$c = \sqrt{32}$ cm

la altura es $\sqrt{32}$

$A_p = A_B + A_L = \frac{B \cdot H}{2} + \left(\frac{B \cdot H}{2}\right) \cdot 3$

Area de la base $= \frac{b \cdot h}{2} = \frac{4 \cdot \sqrt{12}}{2} = 6{,}92 cm^2$

Calculo $H = 4^2 = 2^2 + c^2$ $12 = c^2$ $\sqrt{c^2} = \sqrt{12}$

Area lateral $= \frac{B \cdot h}{2} \cdot 3 = \frac{4 \cdot \sqrt{32}}{2} \cdot 3 = 33{,}94 cm^2$

Teorema de pitagoras

$H^2 = c^2 + c^2 \quad 6^2 = 2^2 + c^2 \quad 32 = c^2 \quad \sqrt{c^2} = \sqrt{32}$

la altura mide $\sqrt{32}$

Area de la piramide $= A_L + A_B = 33{,}94 + 6{,}92 = 40{,}86\,cm^2$

14

$$Area = \frac{P + P'}{2} \cdot Ap + A + A'$$

$$A = \frac{56 + 96}{2} \cdot 12 + 196 + 576 = 1684\,cm^2$$

15

a) Cilindro y semiesfera

Volumen del cilindro $= \pi \cdot r^2 \cdot h$

Volumen de la semiesfera $= \frac{4}{3} \cdot \frac{\pi \cdot r^3}{360} \cdot n$

$V_c = \pi \cdot 6^2 \cdot 7 \quad V_c = 791{,}68\,cm^3$

$V_s = \frac{4}{3} \cdot \frac{\pi \cdot 6^3}{360} \cdot 180 = 452{,}39\,cm^3$

$791{,}68 + 452{,}39 = 1244{,}07\,cm^3$

Area del cilindro $= 2 \cdot \pi \cdot R \cdot (h + r)$

$A_c = 2 \cdot \pi \cdot 6 \cdot (7 + 6) \quad A_c = 490{,}08\,cm^2$

Area de la semiesfera $= \frac{4 \cdot \pi \cdot r^2}{360} \cdot n$

$A_s = \frac{4 \cdot \pi \cdot 6^2}{360} \cdot 180 \quad A_s = 226{,}19\,cm^2$

$A_T = 226{,}19 + 490{,}08 = 716{,}27\,cm^2$

b) cilindro adosado a cono

Volumen de el cilindro $= \pi \cdot R^2 \cdot h$

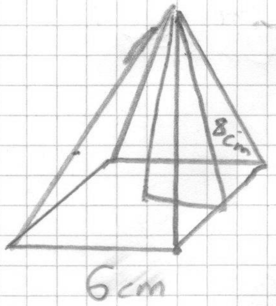
$V_{ci} = \pi \cdot 3^2 \cdot 4 \quad V_c = 113{,}09\ cm^3$

Volumen del cono adosado $= \dfrac{\pi \cdot r^2 \cdot h}{3}$

$V_{co} = \dfrac{\pi \cdot 3^2 \cdot 4}{3} \quad V_{co} = 37{,}69\ cm^3$

$113{,}09 + 37{,}89 = 150{,}78\ cm^3$

16



$A_t = A_L + A_B = 36 + 96 = 142\ cm^2$.

$A_L = \dfrac{P_B \cdot A_P}{2} = \dfrac{24 \cdot 8}{2} = 96\ cm^2$

Area de la base $= L \cdot L = 6 \cdot 6 = 36$

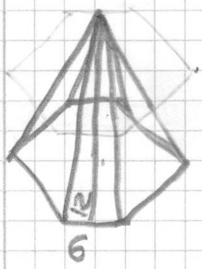
Teorema pitagoras $= h^2 = c_1^2 + c_2^2 = 8^2 = 3^2 + c_2^2 = 55 = c_2^2$

$\sqrt{c^2} = \sqrt{55}$ es la altura

$\sqrt{55}$ es la altura

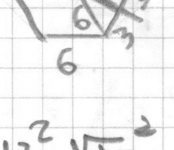
Volumen de la piramide $= \dfrac{Ab \cdot h}{3} = \dfrac{36 \cdot \sqrt{55}}{3} = 88{,}92\ cm^3$

17



Teorema pitagoras $h^2 = c_1^2 + c_2^2$

$6^2 = 3^2 + c_2^2 \quad 36 = 9 + c^2 \quad 27 = c^2 \quad \sqrt{c^2} = \sqrt{27}$



$12^2 = \sqrt{27}^2 + c^2 \quad 144 = 27 + c_2^2 \quad c^2 = 117 \quad \sqrt{c^2} = 1081$

La altura es 10,81 m

Area lateral $= \dfrac{P_B \cdot A_P}{2} = \dfrac{36 \cdot 12}{2} = 216 \, cm^2$

Area de la base $= \dfrac{b \cdot h}{2} \cdot 6 = \dfrac{6 \cdot \sqrt{27}}{2} \cdot 6 = 15{,}57 \cdot 6 = 93{,}42 \, cm^2$

$A_T = A_B + A_L = 93{,}42 + 216 = 309{,}42 \, cm^2$

Volumen $: \dfrac{A_b \cdot h}{3} = \dfrac{93{,}42 \cdot 10{,}81}{3} = 336{,}62 \, cm^3$

19

$A_T = 4 \cdot \pi \cdot r^2 \quad A = 4 \cdot \pi \cdot 6371^2 \quad A = 5{,}10 \cdot 10^8 \, cm^2$

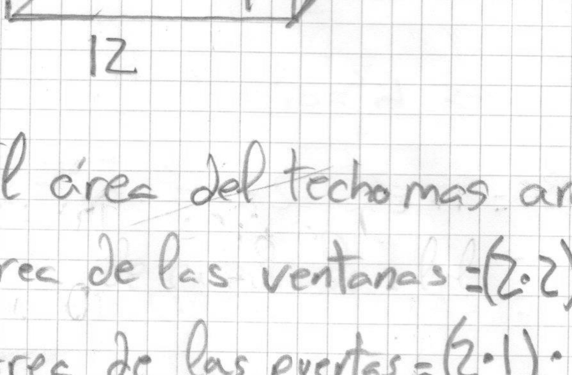
$V = \dfrac{4}{3} \cdot \pi \cdot r^3 \quad V = \dfrac{4}{3} \pi \cdot 6371^3 = 1{,}083 \cdot 10^{12} \, cm^3$

20

$A_B = l \cdot l \quad A_B = 35 \cdot 35 \quad A_B = 1225 \, m^2$

$1225 \cdot 114 = 139650 \, m^3$

21



$A_B = l \cdot l \quad A_B = 12 \cdot 7 = 84 \, m^2$

Area lateral $= 12 \cdot 3{,}5 + 7 \cdot 3{,}5 +$
$+ 12 \cdot 3{,}5 + 7 \cdot 3{,}5 =$
$= 3{,}5 \cdot (12 + 7 + 12 + 7) =$
$= 133 \, m^2$

El area del techo mas area lateral $= 133 + 84 = 217 \, m^2$

Area de las ventanas $= (2 \cdot 2) \cdot 3 = 12 \, m^2$

Area de las puertas $= (2 \cdot 1) \cdot 2 = 4 \, m^2$

Area de ventana mas puerta $= 12 + 4 = 16 \, m^2$

$217 - 16 = 201 \, m^2$ $\quad m^2$ a pintar

Calculo de número de botes $201 : 25 = 8$ botes

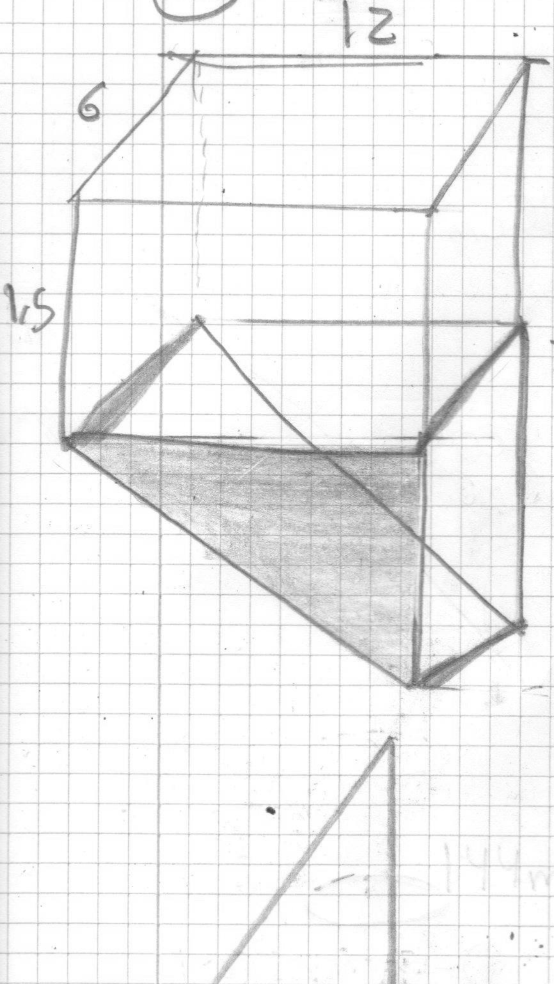
22

$V = a^3$ $V = 8^3$ $V = 512\ cm^2$ mide el cubo de Rubik

$8 : 3 = 2{,}6$ $2{,}6^3 = 18{,}48\ cm^3$ mide una de sus piezas

$$\left(\frac{8}{3}\right)^3 = \frac{8^3}{3^3} = \frac{512}{27} = 18{,}96\ cm^3$$

23



Volumen del hexaedro = $A_B \cdot h$

$V = (6 \cdot 12) \cdot 1{,}5$ $V = 108\ m^2$

Volumen del prisma triangular

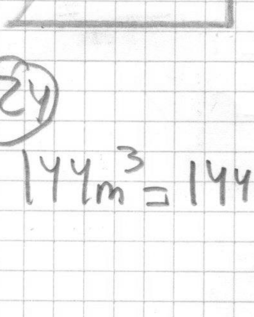
$V = A_B \cdot h$

Area de la base = Area del Triangulo

$A = \frac{b \cdot h}{2}$ $A = \frac{1 \cdot 12}{2}$ $A = 6\ m^2$

$V_{dPT} = 6 \cdot 6$ $V = 36\ m^3$

V_T de la piscina $= 36 + 108 = 144\ m^3$



24

$144\ m^3 = 144000\ l$ $144000\ l : 0{,}5\ l/s = \frac{144000\ l}{0'5\ l/s} =$

$= 288.000\ s = 288\,000\ s \cdot \frac{1\ h}{3600\ s} = 80\ h$

25

Cilindro

$V = \pi \cdot r^2 \cdot h$ $V = \pi \cdot 3{,}1^2 \cdot 10{,}9$ $V = 330\ ml$

26

$V = \frac{A_B \cdot H}{3}$ $V = \frac{18496 \cdot 230{,}35}{3}$ $V = 1420648$

27

Esfera

$A = 4 \cdot \pi \cdot R^2$ $A = 4 \cdot \pi \cdot 5^2$ $A = 314{,}16 cm^2$

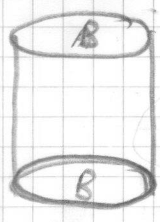
$314{,}16 : 12 = 26{,}18\ cm^2$

28

$V = A_B \cdot H$ $4000 = A_b \cdot 10$ $400 = A_b$

$L_B = \sqrt{400}$ Lado de la base = 20 cm

29



$A_t = 2 \cdot (\pi \cdot r^2) + 2 \cdot \pi \cdot r \cdot h$

$A = 2 \cdot \pi \cdot r\ (r + h)$

$169{,}56 = 2 \cdot \pi \cdot r\ (r + 2r)$

$169{,}56 = 2 \cdot \pi \cdot r \cdot 3r$

$169{,}56 = 2\pi \cdot 3 \cdot r^2$

$169{,}56 = 18{,}84 \cdot r^2$

$\frac{169{,}56}{18{,}84} = r^2$

$9 = r^2$

$\sqrt{r^2} = \sqrt{9}$

$r = 3$

$D = h$

$D = 2 \cdot r$

$H = 2r$

$D = 2 \cdot 3$

$D = 6$

$H = 6$

30 Volumen del gotero

$V = \pi \cdot r^2 \cdot h$ $V = \pi \cdot 4^2 \cdot 14$ $V = 703,71 cm^3$

$703,718 cm^3 = 703718,4 mm^3$

Volumen/gota

Volumen de la esfera

$V_e = \frac{4}{3} \cdot \pi \cdot r^3$ $V_e = \frac{4}{3} \cdot \pi \cdot 0,5^3$ $V_e = 0,52 mm^3$

Calculo del tiempo del gotero

$\frac{703718,4}{0,52} = 1353304,61$ minutos

31

Volumen del cubo Nº 1 = $Arista_1^3$

Volumen del cubo Nº 2 = $Arista_2^3$

$V_{C_2} - V_{C_1} = 271 cm^3$

$A_2^3 - A_1^3 = 271 cm^3$

$(A_1 + 1cm)^3 - A_1^3 = 271 cm^3$

$(A_1 + 1) \cdot (A_1 + 1) \cdot (A_1 + 1) - A^3 = 271 cm^2$

$(\cancel{A^3} + 3A^2 + 3A + 1) - \cancel{A^3} = 271 cm^2$

$3A^2 + 3A + 1 = 271$

$3A^2 + 3A - 270 = 0 \Rightarrow A^2 + A - 90 = 0$

$A = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1 + 360}}{2} = < \frac{-1+19}{2} = \boxed{9cm}$ $\cancel{}$

(30) Volumen del gotero

$V = \pi \cdot r^2 \cdot h \quad V = \pi \cdot 4^2 \cdot 14 \quad V = 703,71 cm^3$

$703,718 cm^3 = 703718,4 mm^3$

Volumen/gota

Volumen de la esfera

$Ve = \frac{4}{3} \cdot \pi \cdot r^3 \quad Ve = \frac{4}{3} \cdot \pi \cdot 0,5^3 \quad Ve = 0,52 mm^3$

Calculo del tiempo del gotero

$\frac{703718,4}{0,52} = 1353304,61$ minutos

(31)

Volumen del cubo Nº 1 = $Arista_1^3$

Volumen del cubo Nº 2 = $Arista_2^3$

$V_{C_2} - V_{C_1} = 271 cm^3$

$A_2^3 - A_1^3 = 271 cm^3$

$(A_1 + 1 cm)^3 - A_1^3 = 271 cm^3$

$(A_1+1) \cdot (A_1+1) \cdot (A_1+1) - A^3 = 271 cm^2$

$(\cancel{A^3} + 3A^2 + 3A + 1) - \cancel{A^3} = 271 cm^2$

$3A^2 + 3A + 1 = 271$

$3A^2 + 3A - 270 = 0 \Rightarrow A^2 + A - 90 = 0$

$A = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1+360}}{2} = \begin{cases} \frac{-1+19}{2} = \boxed{9 cm} \\ \nexists \end{cases}$