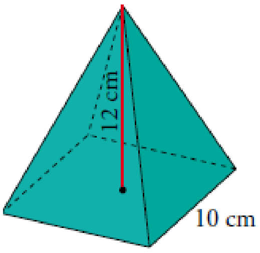
1. Halla el área total de una pirámide regular cuya base es un cuadrado de 10 cm de lado y cuya altura es de 12 cm.



$$A_{pirámide} = A_{base} + 4 \cdot A_{lateral}$$

$$A_{base} = 10 \cdot 10 = 100\ cm^2$$

Apotema de la base a´= 5cm

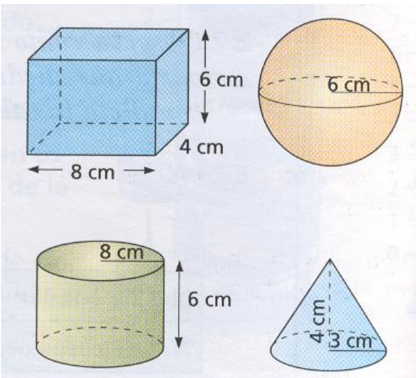
Altura del triángulo lateral $a^2 = 12^2 + 5^2 = 169 \rightarrow a = 13$

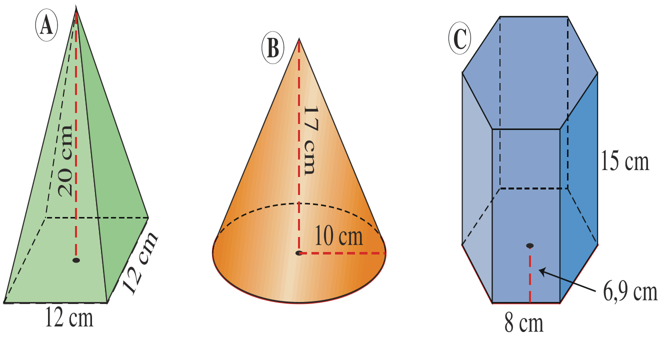
$$4A_{lateral} = 4\frac{10 \cdot 13}{2} = 260\ cm^2$$

$$A_{pirámide} = A_{base} + 4A_{lateral} = 360\ cm^2$$

$$A_{piramide} = \frac{1}{2}P(a + a´) = \frac{1}{2}40(5 + 13) = 360\ cm^2$$

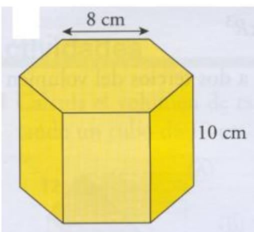
2. Calcula el área total y el volumen de los siguientes cuerpos geométricos.

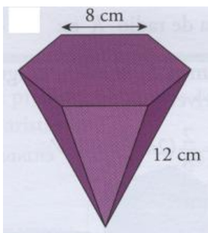


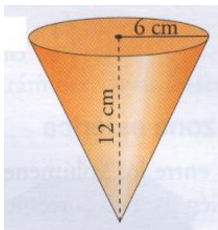


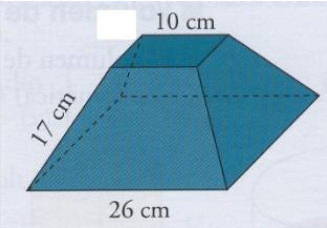
3. Calcula el área y el volumen de las siguientes figuras

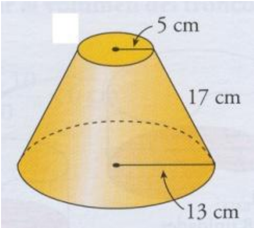
3.1.) 3.2.)3.3.)

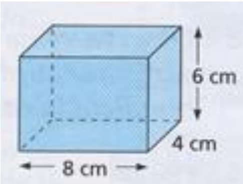






3.4.) 

3.5.) 

2.1. 

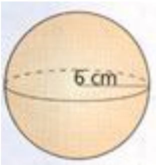
Dos rectángulos de lados 8 y 6 A = 8·6 = 48 cm^2

Dos rectángulos de lados 8 y 4 A = 8·4 = 32 cm^2

Dos rectángulos de lados 4 y 6 A = 4·6 = 24 cm^2

Área total = 2·32 + 2·48+2·24 = 96 + 64 + 48 = 208 cm^2

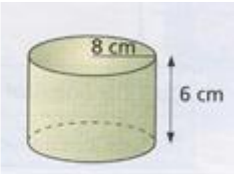
$$V_{ortoedro} = A_{base} \cdot h = 8 \cdot 4 \cdot 6 = 192 \ cm^3$$

2.2. 

$$A_{esfera} = 4\,\pi\, r^2 = 4\,\pi 36 = 144\,\pi = 452´39\, cm^2$$

$$V_{esfera} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi 6^3 = 904´78\, cm^3$$

2.3.



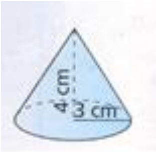
$$A_{base} = \pi\, r^2 = 64\pi = 201´06\, cm^2$$

$$A_{lateral} = 2\pi r h = 2\pi 8 \cdot 6 = 96\pi = 301´59\, cm^2$$

$$A_{cilindro} = A_{lateral} + 2 \cdot A_{base} = 703´65\, cm^2$$

$$V_{cilindro} = A_{base} \cdot h = \pi r^2 \cdot h = 201´06 \cdot 6 = 1206´36\, cm^3$$

2.4



$A_{cono} = A_{lateral} + A_{base}$ $\qquad$ $A_{cono} = \pi r(g + r)$

$A_{lateral} = \pi r g$ g generatriz $g^2 = 3^2 + 4^2 = 25 \rightarrow g = 5\ cm$

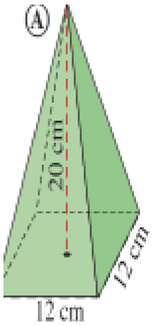
$$A_{lateral} = \pi 3 \cdot 5 = 15\pi = 47'12\ \ cm^2$$

$$A_{base} = \pi\, r^2 = 9\pi = 28'27\ \ cm^2$$

$$A_{cono} = 47'12 + 28'27 = 75'39\ \ cm^2$$

$V_{cono} = \frac{1}{3}\pi r^2 \cdot h == \frac{1}{3}\pi 9 \cdot 4 = 12\pi = 37'70\ \ cm^3$

A)



$$A_{pir\acute{a}mide} = A_{base} + 4 \cdot A_{lateral}$$

$$A_{base} = 12 \cdot 12 = 144\ cm^2$$

Apotema a´= 6 cm

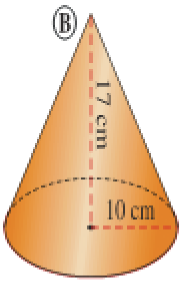
altura triángulo lateral $a^2 = 20^2 + 6^2 = 436 \rightarrow a = 20{,}88$ cm

$$4A_{lateral} = 4\frac{12 \cdot 20{,}88}{2} = 501{,}12\ \ cm^2$$

$$A_{pir\acute{a}mide} = 144{+}501{,}12 = 144 + 501{,}12 = 645{,}12\ cm^2$$

$V_{pir\acute{a}mide} = \frac{1}{3}A_{base}\, h = \frac{1}{3} \cdot 144 \cdot 20 = 960\ \ cm^3$

B)



$$A_{cono} = A_{lateral} + A_{base}$$

$$A_{lateral} = \pi r g$$

$$g^2 = 17^2 + 10^2 = 389 \rightarrow g = 19{,}72\ cm$$

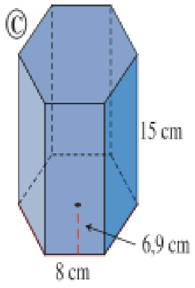
$$A_{lateral} = \pi 10 \cdot 19'72 = 197'2\pi = 619'5\ \ cm^2$$

$$A_{base} = \pi\, r^2 = 100\pi = 314'15\ \ cm^2$$

$$A_{cono} = 619'5\ + 314'15 = 933'55\ \ cm^2$$

$$V_{cono} = \frac{1}{3}\pi r^2 \cdot h = \frac{1}{3}\pi 100 \cdot 17 = 566'67\pi = 1780'19\ cm^3$$

C)



$$A_{prisma} = 2A_{base} + 6 \cdot A_{lateral}$$

$$A_{prisma} = p(h + a)$$

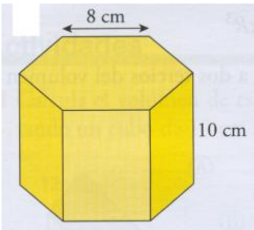
$$A_{base} = \frac{p \cdot a_p}{2} = \frac{6 \cdot 8 \cdot 6'9}{2} = 165{,}6\ cm^2$$

$$A_{lateral} = 8 \cdot 15 = 120\ cm^2$$

$$A_{prisma} = 331{,}2 + 6 \cdot 120 = 331{,}2 + 720 = 1051{,}2\ cm^2$$

$$V_{prisma} = A_{base} \cdot h = 165{,}6 \cdot 15 = 2.484\ cm^3$$

3. 1)



$$A_{prisma} = 2A_{base} + 6 \cdot A_{lateral}$$

$$A_{base} = \frac{p \cdot a_p}{2} = \frac{6 \cdot 8 \cdot ap}{2}$$

$$8^2 = 4^2 + ap^2 \rightarrow ap = \sqrt{64 - 16} = \sqrt{48} = 6'92cm$$

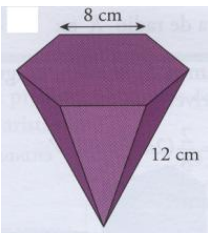
$$A_{base} = \frac{p \cdot a_p}{2} = \frac{6 \cdot 8 \cdot 6'92}{2} = 166'08\ cm^2$$

$$A_{lateral} = 8 \cdot 10 = 80\ cm^2$$

$$A_{prisma} = 332'16 + 6 \cdot 80 = 332'16 + 480 = 812'16\ cm^2$$

$$V_{prisma} = A_{base} \cdot h = 166'08 \cdot 10 = 1.660'8\ cm^3$$

3.2



$$A_{pirámide} = A_{base} + A_{lateral}$$

$$A_{base} = \frac{p \cdot a_p}{2} = \frac{6 \cdot 8 \cdot ap}{2}$$

$$8^2 = 4^2 + ap^2 \rightarrow ap = \sqrt{64 - 16} = \sqrt{48} = 6'92cm$$

$$A_{base} = \frac{p \cdot a_p}{2} = \frac{6 \cdot 8 \cdot 6´92}{2} = 166´08\, cm^2$$

$$A_{lateral} = 6 \cdot A_{triángulo}$$

$$A_{triángulo} = \frac{8 \cdot h}{2}$$

$$12^2 = 4^2 + h^2 \rightarrow h^2 = 144 - 16 = 128 \rightarrow h = 11´31\, cm$$

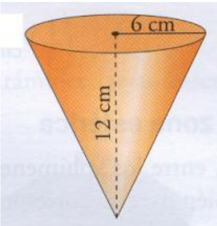
$$A_{triángulo} = \frac{8 \cdot 11´31}{2} = 45´24\, cm^2$$

$$A_{lateral} = 6 \cdot 45´24 = 271´44\, cm^2$$

$$A_{pirámide} = A_{base} + A_{lateral} = 166´08 + 271´44 = 437´52\ cm^2$$

$$V_{pirámide} = \frac{1}{3} A_{base}\, h = 166´08 \cdot 11´31 = 1878´36\, cm^3$$

3.3



$$A_{cono} = A_{lateral} + A_{base}$$

$A_{lateral} = \pi r g$ g generatriz $g^2 = 12^2 + 6^2 = 180 \rightarrow g = 13{,}42\, cm$

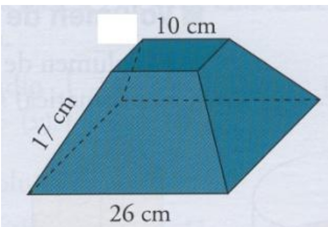
$$A_{lateral} = \pi \cdot 6 \cdot 13´42 = 80´52\pi = 252´95\ cm^2$$

$$A_{base} = \pi\, r^2 = 36\pi = 113´09\ cm^2$$

$$A_{cono} = 252´95 + 113´09 = 366´04\ cm^2$$

$$V_{cono} = \frac{1}{3}\pi r^2 \cdot h = \frac{1}{3} 113´09 \cdot 12 = 339´27\, cm^3$$

3.4



$$A_{tronco\ \ de\ piramide} = A_{base\ mayor} + A_{base\ menor} + A_{lateral}$$

$$A_{base\ mayor} = 26 \cdot 26 = 676\, cm^2$$

$$A_{base\ menor} = 10 \cdot 10 = 100\, cm^2$$

$$A_{lateral} = 4 \cdot A_{trapecio}\ A_{trapecio} = \frac{26+10}{2} \cdot a$$

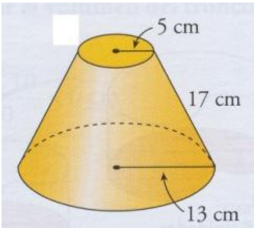
$$17^2 = 8^2 + a^2 \rightarrow a = \sqrt{289 - 64} = \sqrt{225} = 15cm$$

$$A_{trapecio} = \frac{26 + 10}{2} \cdot 15 = 270 \ cm^2$$
$$A_{lateral} = 4 \cdot 270 = 1080 \ cm^2$$

$$A_{tronco\ \ de\ piramide} = A_{base\ mayor} + A_{base\ menor} + A_{lateral} = 676 + 100 + 1080$$
$$= 1856 \ cm^2$$

$$V = \frac{1}{3} h\left(A_b + A_{b'} + \sqrt{A_b \cdot A_b{}'}\right) = \frac{1}{3} \cdot 15 \cdot \left(676 + 100 + \sqrt{676 \cdot 100}\right)$$
$$= 5 \cdot (676 + 100 + 260) = 5180 \ cm^3$$

3.5



$$A_{tronco\ \ de\ cono} = A_{base\ mayor} + A_{base\ menor} + A_{lateral}$$

$$A_{base\ mayor} = \pi\, r^2 = \pi\ 13^2 = 169\pi = 530{\acute{}}91\ cm^2$$

$$A_{base\ menor} = \pi\, r'^2 = \pi\ 5^2 = 25\pi = 78{\acute{}}54\ cm^2$$

$$A_{lateral} = \pi(r + r')g = \pi(13 + 5) \cdot 17 = 306\pi = 961{\acute{}}3\ cm^2$$

$$A_{tronco\ \ de\ cono} = 530{\acute{}}91 + 78{\acute{}}54 + 961{\acute{}}3 = 1570{\acute{}}75\ cm^2$$

$$V = \frac{\pi h(\ r^2 +\ r'^2 + r \cdot r')}{3}$$

$$17^2 = 8^2 + h^2 \Rightarrow\ h^2 = 289 - 64 = 225 \Rightarrow h = 15cm$$

$$V = \frac{\pi 15(169 + 25 + 65)}{3} = 5\pi 259 = 4.068{,}37\ cm^3$$