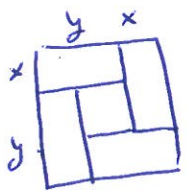
CANGUR 2018 3 ESO

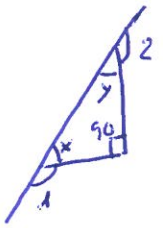
① 

$2x+2y = 16$

$x+y = 8$

$P = 4(x+y) = 4 \cdot 8 = \underline{32\ cm}$ e)

② 29 de septiembre $= 2+9+0+9 = \underline{20}$ b)

③ 

$\hat{1}+\hat{x}+\hat{y}+\hat{2} = 360^\circ$

$\hat{x}+\hat{y} = 90^\circ$

$\hat{1}+\hat{2} = 360^\circ - 90^\circ = \underline{270^\circ}$ c)

④ $12 \rightarrow (1+2)\cdot 4$

$24 \rightarrow (2+4)\cdot 4$

$36 \rightarrow (3+6)\cdot 4$

$48 \rightarrow (4+8)\cdot 4$

4 resultados d)

(escribir la tabla del 4 desde $1\cdot 4$ hasta $25\cdot 4$ y ver el resultado

$1\cdot 4 = 4$

$2\cdot 4 = 8$

$3\cdot 4 = 12 \rightarrow 1+2=3$

⋮

⑤

$1+1+1+1+9 = 13$

$1+1+1+5+5 = 13$

$1+1+3+1+7 = 13$

$1+1+3+3+5 = 13$

$1+3+3+3+3 = 13$

} 5 posibilidades b)

⑥ $11, 22, 33, \dots, 99 \rightarrow$ 9 números.

$101, 111, \dots 191 \rightarrow$ 10 números

$202 \dots 292 \rightarrow$ 10 números

⋮

$909 \dots 999 \rightarrow$ 10 números

} TOTAL $9+\underbrace{10+10+\dots+10}_{9\text{ veces}} = 9+9\cdot 10 = \underline{99}$

d)

⑦ x camisetas
y pantalones
z faldas

$x \cdot y = 21 = 7\cdot 3$

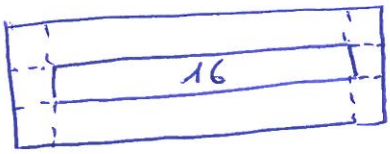
$x \cdot z = 35 = 7\cdot 5$

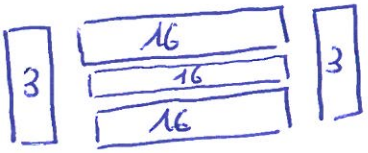
7 camisetas

d)

(8)

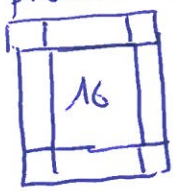
máximo

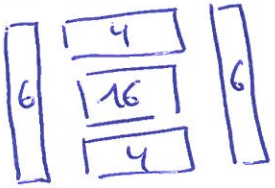




$2 \cdot 3 + 3 \cdot 16 = 6 + 48 = \underline{54}$ e)

- Si pidiera el mínimo





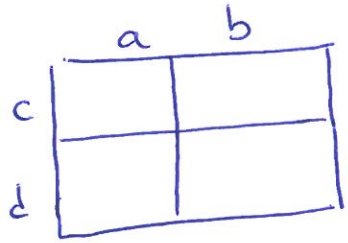
$2 \cdot 6 + 2 \cdot 4 + 16 = 12 + 8 + 16 = \underline{36}$

(9)

(C)	D	B	(E)	A
A	B	(D)	(E)	C
E	(A)	(D)	B	C
(C)	E	A	D	(B)
D	(A)	E	C	(B)
B	(A)	C	(E)	D

$\Rightarrow$ CADEB b)

(10)



$a \cdot c = 6 \rightarrow c = \frac{6}{a}$

$b \cdot c = 9 \rightarrow b = 9 : c = 9 : \frac{6}{a} = \frac{9a}{6}$

$a \cdot d = 8 \rightarrow d = \frac{8}{a}$

$b \cdot d = ?$

$\hookrightarrow \frac{9\cancel{a}}{6} \cdot \frac{8}{\cancel{a}} = \frac{9 \cdot 8}{6} = \frac{72}{6} = 12\ cm^2$ c)

(11)

- $36 \mid 2$, $18 \mid 2$, $9 \mid 3$, $3 \mid 3$, 1 — $36 = 2^2 \cdot 3^2 \rightarrow$ nº de divisores $(2+1)\cdot(2+1) = 9$
- $45 \mid 3$, $15 \mid 3$, $5 \mid 5$, 1 — $45 = 3^2 \cdot 5^1 \rightarrow$ nº divisores $(2+1)\cdot(1+1) = 6$
- $42 \mid 2$, $21 \mid 3$, $7 \mid 7$, 1 — $42 = 2^1 \cdot 3^1 \cdot 7^1 \rightarrow$ nº divisores $(1+1)\cdot(1+1)\cdot(1+1) = 8$
- $50 \mid 2$, $25 \mid 5$, $5 \mid 5$, 1 — $50 = 2^1 \cdot 5^2 \rightarrow$ nº divisores $(1+1)\cdot(2+1) = 6$
- $48 \mid 2$, $24 \mid 2$, $12 \mid 2$, $6 \mid 2$, $3 \mid 3$, 1 — $48 = 2^4 \cdot 3^1 \rightarrow$ nº divisores $(4+1)\cdot(1+1) = \boxed{10}$ → d)

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(11) también calculando los divisores (2)

$D(36) = \{1, 2, 3, 4, 6, 9, 12, 18, 36\} \rightarrow 9$

$D(42) = \{1, 2, 3, 6, 7, 14, 21, 42\} \rightarrow 8$

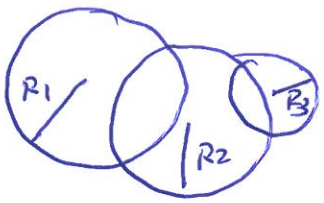
$D(45) = \{1, 3, 5, 9, 15, 45\} \rightarrow 6$

$D(48) = \{1, 2, 3, 4, 6, 8, 12, 18, 24, 48\} \rightarrow 10$

$D(50) = \{1, 2, 5, 10, 25, 50\} \rightarrow 6$

d)

(12)



$2\pi R_1 + 2\pi R_2 + 2\pi R_3 = 64$

$R_1 + R_2 + R_3 = \frac{64}{2\pi} = \frac{32}{\pi}$

c)

(13)

$V_1 \quad V_2 \quad V_3 \quad V_4 \quad V_5$

$3 + 3 + 5 + 3 + 3 = 17$ passeigs.

1 passeig $V_1 \rightarrow$ 2 de V_1 + $3V_2 = 5$

1 passeig $V_2 \rightarrow 2V_2 + 3V_1 + 5V_3 = 10$

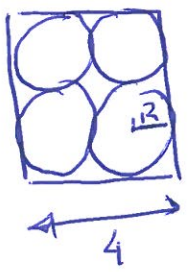
1 passeig $V_3 \rightarrow 4V_3 + 3V_2 + 3V_4 = 10$

1 passeig $V_4 \rightarrow 2V_4 + 5V_3 + 3V_5 = 10$

1 passeig $V_5 \rightarrow 2V_5 + 3V_4 = 5$

c)

(14)



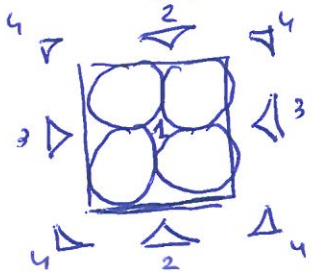
lado 4 $\Rightarrow$ radio 1

$A_{\square} = 4^2 = 16$

$A_O = \pi R^2 = \pi \cdot 1^2 = \pi$

$A_{sombra} = A_O + A_{central} = \pi + \frac{16 - 4\pi}{4} = \frac{4\pi + 16 - 4\pi}{4} = \frac{16}{4} = 4$

a)



$\hookrightarrow \frac{A_{\square} - 4A_O}{4} = \frac{16 - 4\pi}{4}$

(15) con abono → 10 €

sin abono → 40 €

200 espectadores < x tienen abono / 200 − x no tienen abono

$$10x + 40.(200-x) = 4400$$

$$10x + 8000 - 40x = 4400$$

$$-8000 - 4400 = 40x - 10x$$

$$3600 = 30x$$

$$x = \frac{3600}{30} = 120 \text{ abonados}$$

de 200 plazas < van 120 abonados / $\frac{3}{4}$ de 80 no abonados = 60 no abonados

$$120.10 + 60.40 = 3600 \text{ €} \qquad \underline{b)}$$

(16)

12 alumnos participan

a chicos

b chicas

participan

$\frac{a}{2}$ chicos

$\frac{b}{3}$ chicas

no participan

$\frac{a}{2}$ chicos

$\frac{2b}{3}$ chicas

Como el nº de chicos y chicas que no participan es el mismo

$$\frac{a}{2} = \frac{2b}{3} \rightarrow \boxed{b = \frac{3a}{4}}$$

total $\frac{a}{2} + \frac{b}{3} = 12 \rightarrow \frac{a}{2} + \frac{\frac{3a}{4}}{3} = 12$

$$\frac{a}{2} + \frac{3a}{12} = 12$$

$$\frac{6a}{12} + \frac{3a}{12} = 12 \rightarrow \frac{9a}{12} = 12$$

$$9a = 12.12$$

$$a = \frac{12.12}{9} = \boxed{16}$$

$$b = \frac{3.16}{4} = \boxed{12}$$

TOTAL ALUMNOS $16 + 12 = \boxed{28}$ $\underline{d)}$

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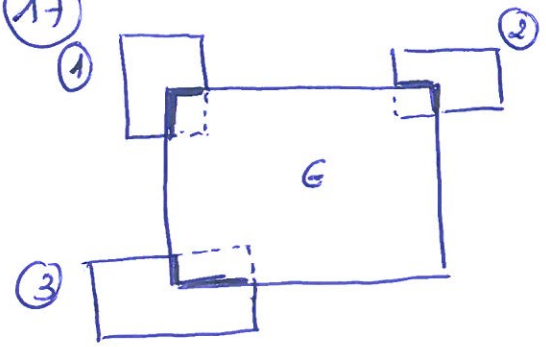
(17)



$P_G = 30$

$P_1 + P_2 + P_3 = 20$

La parte discontinua es la 4ª parte

$\frac{P_1+P_2+P_3}{4} = \frac{20}{4} = 5\,cm$

El perímetro que piden es

$$(P_G - 5) + [(P_1+P_2+P_3) - 5] =$$

(−5: negrita; −5: discontinua)

$$= (30-5) + (20-5) = 25+15 = 40$$ c)

(18) TALENT. $\times$ = 746136 $\Rightarrow$ divisible entre 2, 3, 4, 6, 9

746136 : 2 = 373068 NO

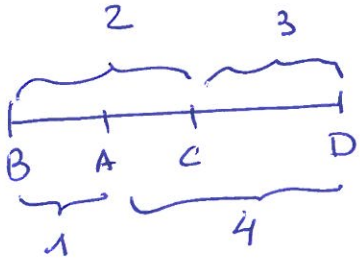
746136 : 3 = 248712 ← L = 8 d)

746136 : 4 = 186534 NO

746136 : 6 = 124356 NO

746136 : 9 = 82904 NO

(19)



B y D b)

(20) $a+b+c+d+e = 17$

$a \cdot b \cdot c \cdot d \cdot e \Rightarrow$ máx.

$1+2+3+4+7 = 17$ $\quad 1.2.3.4.7 = 168$

$1+2+3+5+6 = 17$ $\quad 1.2.3.5.6 = 180$ ✓

e)

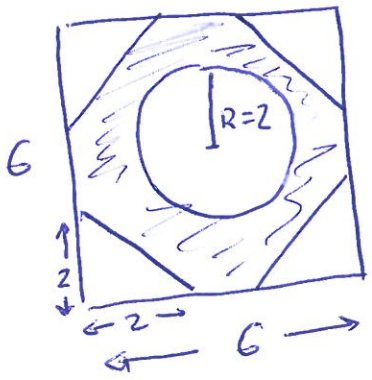
(21)

reloj marca 12:05 → llev 10 min retraso → son las 12:15

el cree son las 12 ←

e)

(22)



$A_{sombreada} = A_{cuadrado} - 4A_{triangulo} - A_{circulo}$

$A_{\square} = l^2 = 6^2 = 36\ cm^2$

$A_{\triangle} = \frac{b \cdot a}{2} = \frac{2 \cdot 2}{2} = 2cm$

$A_{O} = \pi R^2 = \pi \cdot 2^2 = \pi 4cm$ $\Rightarrow$

$\Rightarrow A_{sombra} = 36 - 4 \cdot 2 - \pi \cdot 4 =$

$= 36 - 8 - 4\pi = 28 - 4\pi = 4 \cdot (7 - \pi)\ cm^2$

(sacó factor común)

a)

(23) 7 cubos

el del centro del 1 al 6

Los otros 6 →

1°) del 1 al 5 extenor (el 6 apesadu)

2°) del 2 al 6 extenor (el 1 apesadu)

3°) 1, 2, 4, 5, 6 extenor (el 3 apesadu)

4°) 1, 2, 3, 5, 6 extenor (el 4 apesadu)

5°) 1, 2, 3, 4, 6 extenor (el 5 apesadu)

6°) 1, 3, 4, 5, 6 extenor (el 2 apesadu)

La suma de las caras $1 + 2 + 3 + 4 + 5 + 6 = 21$

como son 6 cubos $6 \cdot 21 = 126$

si quitamos los numeros que estan pegados al del centro

sumar $1 + 2 + 3 + 4 + 5 + 6 = 21$

Luego los puntos de las caras extenores son $126 - 21 = 105$

c)

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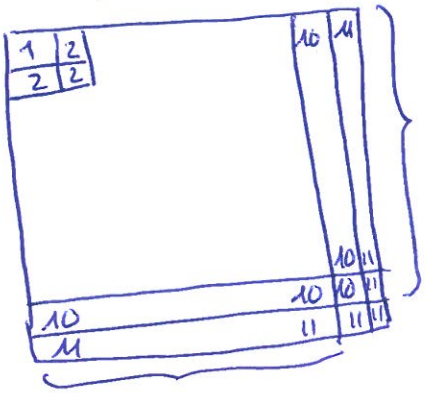
(24) Si hay 121 cuadrados, está formado por 11 filas y 11 columnas. (4)

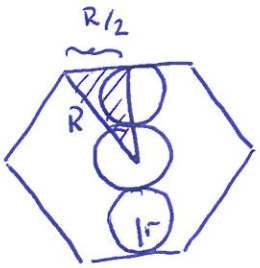


hay 10 cuadrados con un (10) en la columna

hay 9 cuadrados con un (10) en la fila

TOTAL $9+10=19$ b)

(25)



$$R^2=\left(\frac{R}{2}\right)^2+(3r)^2$$

$$R^2=\frac{R^2}{4}+9r^2$$

$$R^2-\frac{R^2}{4}=9r^2$$

$$\frac{3R^2}{4}=9r^2 \longrightarrow R^2=\frac{36r^2}{3}$$

$$R=\sqrt{\frac{36R^2}{3}}=\frac{6r}{\sqrt{3}}=$$

$$=\frac{6r}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}=\frac{6r\sqrt{3}}{3}=\frac{2\cdot r\cdot\sqrt{3}}{3}$$

Relación entre los perímetros:

Perímetro hexágono grande $P=6R$

Perímetro hexágono pequeño $P'=6r$

$$\frac{P}{P'}=\frac{6R}{6r}=\frac{\frac{2r\sqrt{3}}{3}}{r}=\boxed{\frac{2\sqrt{3}}{3}}$$ a)

(26)

CUARTOS	SEMIFINAL	FINAL
Marge vs Homer	Marge vs Edna	Marge vs Krusty
Edna vs Flanders		
Krusty vs Lisa	Krusty vs Bart	
Bart vs Apu		

Marge ganadora. $\Rightarrow$ b)

27

1 litro fruta
3 litros agua
TOTAL 4 litros

$\Rightarrow \frac{1}{4}$ de fruta $\Rightarrow 25\%$

↳ Cojo 3 litros al 25%
+ 2 litros agua
TOTAL 5 litros

$\Rightarrow$

Inversa

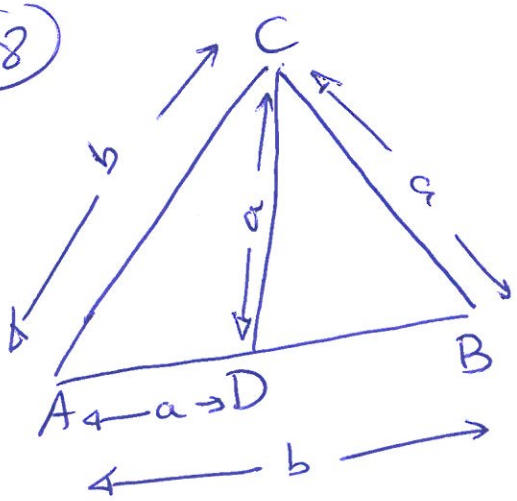
$3 \longrightarrow 25\%$
$5 \longrightarrow x$

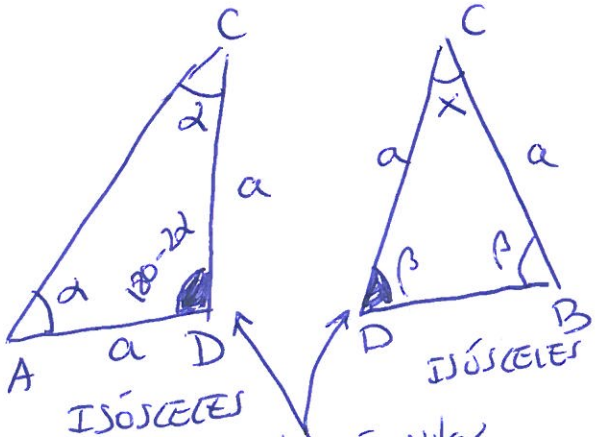
$\frac{5}{3} = \frac{25}{x}$

$x = \frac{25 \cdot 3}{5} = 15\%$

b)

28



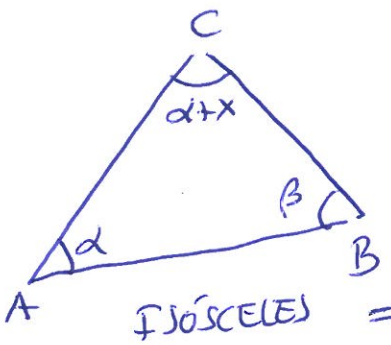


Estos ángulos suma 180° (ángulo plano)

$(180 - 2\alpha) + \beta = 180$

$\beta = 180 - 180 + 2\alpha$

$\boxed{\beta = 2\alpha}$



ISÓSCELES $\Rightarrow \alpha + x = \beta$

además la suma de los ángulos es 180°

$\alpha + \underbrace{\alpha + x} + \beta = 180$

$\alpha + \beta + \beta = 180$

$\alpha + 2\alpha + 2\alpha = 180$

$5\alpha = 180$

$\alpha = \frac{180}{5} = 36°$

como $\alpha + x = \beta$

$\alpha + x = 2\alpha$

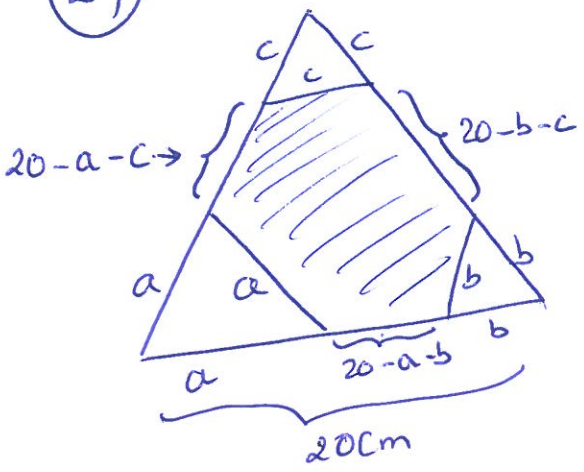
$x = 2\alpha - \alpha$

$x = \alpha$

$\boxed{x = 36°}$

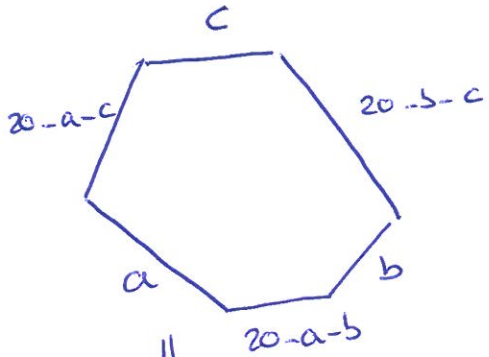
c)

(29)



$P = 60$

$l = \frac{60}{3} = 20cm$



Perímetro figura sombreada

$a + (20 - a - c) + c + (20 - b - c) + b + (20 - a - b) = 40$

$20 + 20 - c + 20 - a - b = 40$

$60 - a - b - c = 40$

$60 - 40 = a + b + c$

$a + b + c = 20$

Perímetre de los 3 triángulos $= 3(a+b+c) = 3 \cdot 20 = 60$ cm

$\hookrightarrow 3a + 3b + 3c = 3(a+b+c)$

e)

(30)

inicial + 1r día + 2n día

$1 + 5 + 11 = 17$ e)