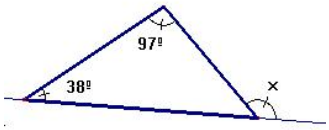
IES MURILLO

Maths 3rd ESO

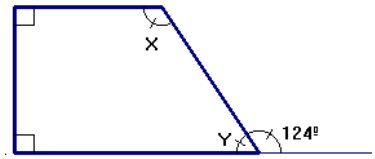
GEOMETRY

1. Find the angles marked with letters (1 point)

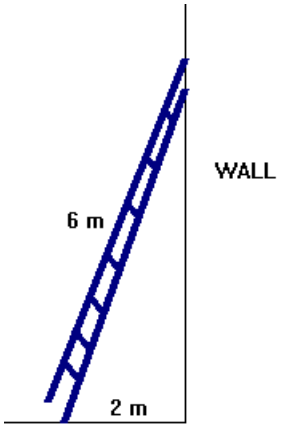
a)



b)

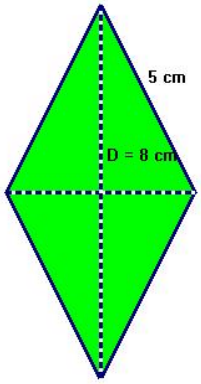


2. A ladder leans against a vertical wall. The length of the ladder is 6m. The bottom of the ladder is 2 m from the base of the wall. How high is the top of the ladder above the ground? (1 point)

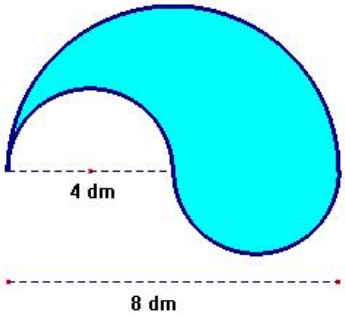


3. Find the area and perimeter of these shapes: (3 points)

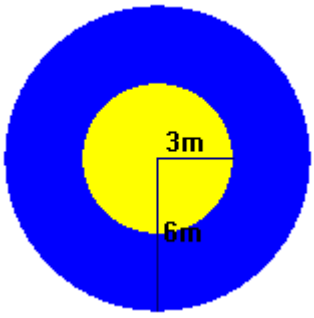
a)



b)

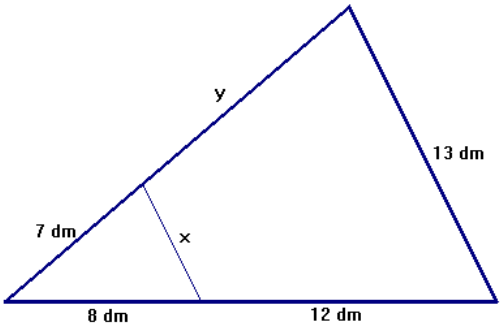


c)

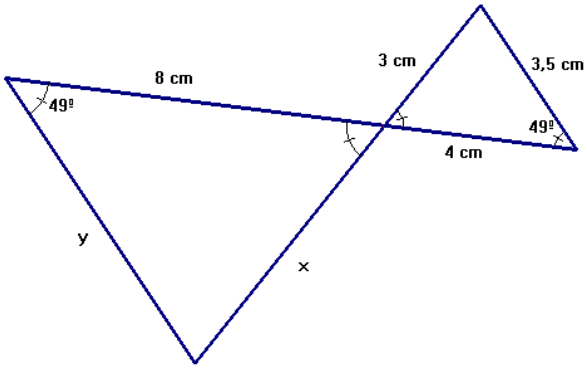


4. Use similar triangles to find the sides marked with letters: (2 points)

a)



b)



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Maths 3rd ESO

5. Work out and simplify: (1 point)

$$\frac{2}{3}\cdot\left(\frac{3}{5}-\frac{1}{3}\right)+\frac{7}{5}\cdot\frac{1}{3}=$$

6. Write each of the following expressions as a single positive power: (1 point)

a) $\frac{2^5\cdot 2^4}{4\cdot 2^3}=$

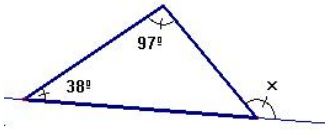
b) $\left(\frac{2}{5}\right)^{-2}\div\frac{5^2}{2}=$

7. A television is on sale for €520. If the sale price is 20 % less than the regular price. What was the regular price? (1 point)

SOLUTION

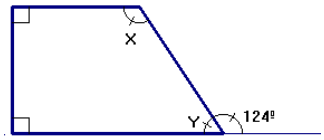
1. Find the angles marked with letters

a)



$$97 + 38 = 135$$
$$\hat{X} = 135^o$$

b)

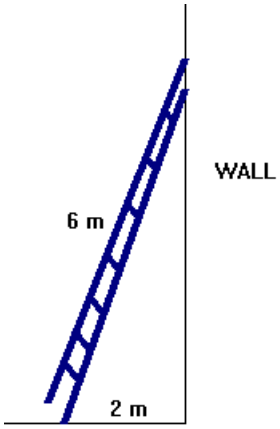


$$\hat{Y} = 180 - 124 = 56^o$$
$$\hat{X} + \hat{Y} = 180$$
$$\hat{X} = 124^o$$

2. Right triangle: Pythagoras' Theorem

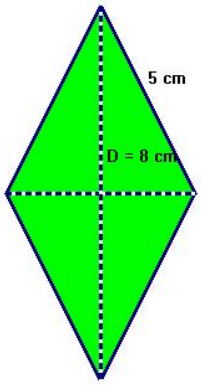
$$x^2 = 6^2 - 2^2 = 36 - 4 = 32$$

$$x = \sqrt{32} = 5.66 m$$



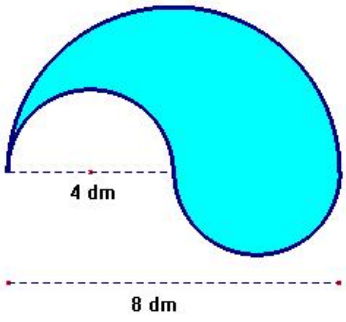
3. Find the area and perimeter of these shapes:

a)



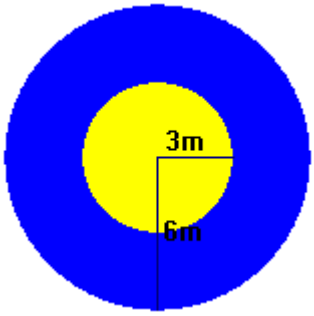
$$P = 4 \times 5 = 20 \text{ cm}$$
$$A = \frac{D \cdot d}{2}$$
$$x^2 = 5^2 - 4^2 = 9$$
$$x = 3 \Rightarrow d = 6 \text{ cm}$$
$$A = \frac{8 \cdot 6}{2} = 24 \text{ cm}^2$$

b)



$$A = \frac{\pi \cdot r^2}{2} = \frac{\pi \cdot 4^2}{2} = 25.13 \text{ dm}^2$$
$$P = Lcircum + \frac{1}{2} LCIRCUM$$
$$P = 2\pi \cdot 2 + \frac{2\pi \cdot 4}{2} = 25.13 \text{ dm}$$

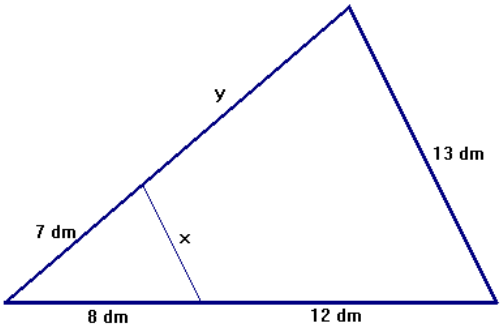
c)



$$A = \pi \cdot 6^2 - \pi \cdot 3^2 = 84.82 \text{ m}^2$$
$$P = Lcircum + LCIRCUM$$
$$P = 2\pi \cdot 3 + 2\pi \cdot 6 = 56.55 \text{ m}$$

4. Use similar triangles to find the sides marked with letters:

a)

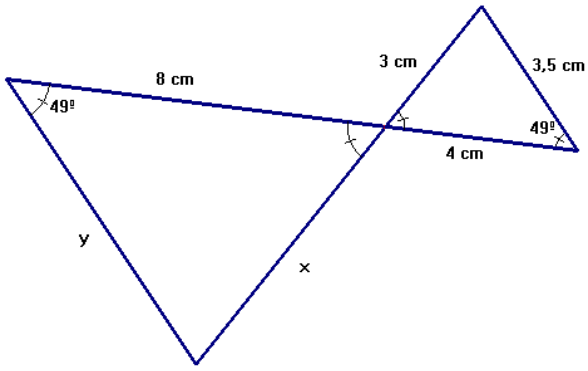


$$\frac{x}{13}=\frac{8}{20}\rightarrow 20x=104\rightarrow x=\frac{104}{20}=5.2\text{ dm}$$

$$\frac{7}{z}=\frac{8}{20}\rightarrow 8z=140\rightarrow z=\frac{140}{8}=17.5\text{ dm}$$

$$z=7+y\rightarrow y=17.5-7\rightarrow y=10.5\text{ dm}$$

b)



$$\frac{8}{4}=\frac{y}{3.5}\rightarrow 28=4y\rightarrow y=7\text{ cm}$$

$$\frac{8}{4}=\frac{x}{3}\rightarrow 24=4x\rightarrow x=6\text{ cm}$$

5. Work out and simplify:

$$\frac{2}{3}\cdot\left(\frac{3}{5}-\frac{1}{3}\right)+\frac{7}{5}\cdot\frac{1}{3}=\frac{2}{3}\cdot\frac{9-5}{15}+\frac{7}{15}=\frac{8}{45}+\frac{7}{15}=\frac{8}{45}+\frac{21}{45}=\frac{29}{45}$$

6. Write each of the following expressions as a single positive power:

a) $$\frac{2^5\cdot 2^4}{4\cdot 2^3}=\frac{2^5\cdot 2^4}{2^2\cdot 2^3}=\frac{2^9}{2^5}=2^4$$

b) $$\left(\frac{2}{5}\right)^{-2}\div\frac{5^2}{2}=\frac{5^2}{2^2}\div\frac{5^2}{2}=\frac{5^2\cdot 2}{2^2\cdot 5^2}=\frac{1}{2}$$

7. A television is on sale for €520. If the sale price is 20 % less than the regular price. What was the regular price?

$$\frac{80}{100}=\frac{520}{x}\rightarrow 80x=52000\rightarrow x=\frac{52000}{80}=650$$

The regular price was €650