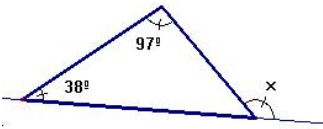


GEOMETRY

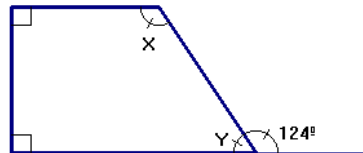
1. Find the angles marked with letters

(1 point)

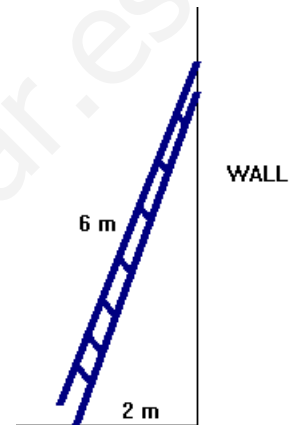
a)



b)



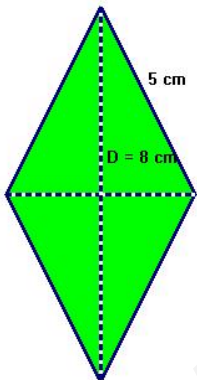
2. A ladder leans against a vertical wall. The length of the ladder is 6 m. The bottom of the ladder is 2 m from the base of the wall. How high is the top of the ladder above the ground? (1 point)



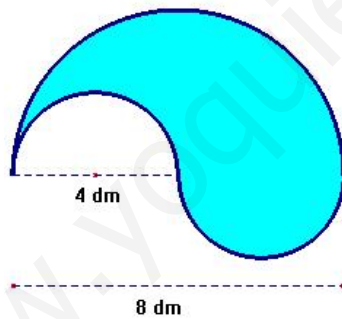
3. Find the area and perimeter of these shapes:

(3 points)

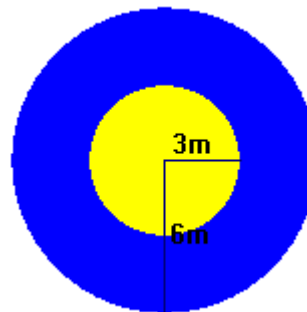
a)



b)



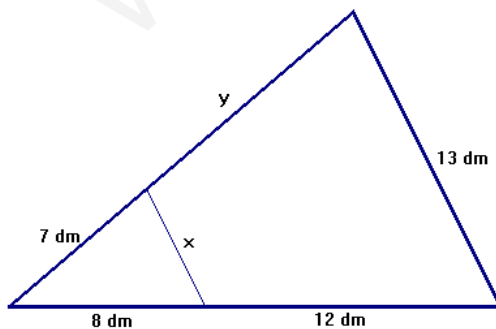
c)



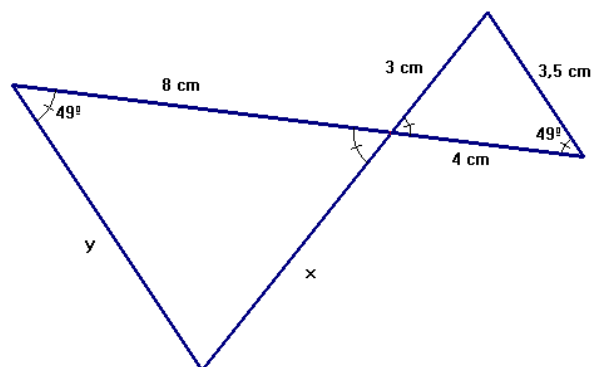
4. Use similar triangles to find the sides marked with letters:

(2 points)

a)



b)





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?

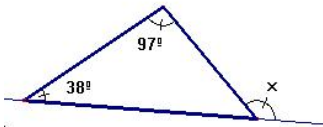
(1 point)

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SOLUTION

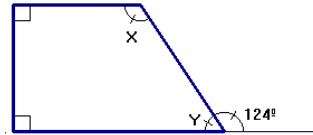
1. Find the angles marked with letters

a)



$$97 + 38 = 135$$

$$\hat{X} = 135^\circ$$



b)

$$\hat{Y} = 180 - 124 = 56^\circ$$

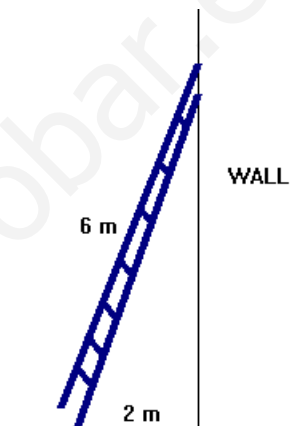
$$\hat{X} + \hat{Y} = 180$$

$$\hat{X} = 124^\circ$$

2. Right triangle: Pythagoras' Theorem

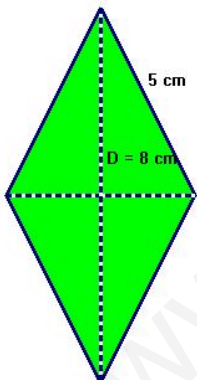
$$x^2 = 6^2 - 2^2 = 36 - 4 = 32$$

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



3. Find the area and perimeter of these shapes:

a)



$$P = 4 \times 5 = 20 \text{ cm}$$

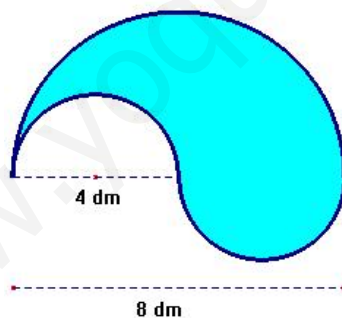
$$A = \frac{D \cdot d}{2}$$

$$x^2 = 5^2 - 4^2 = 9$$

$$x = 3 \Rightarrow d = 6 \text{ cm}$$

$$A = \frac{8 \cdot 6}{2} = 24 \text{ cm}^2$$

b)

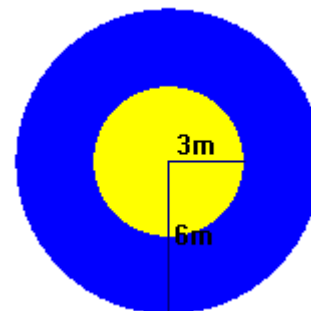


$$A = \frac{\pi \cdot r^2}{2} = \frac{\pi \cdot 4^2}{2} = 25.13 \text{ dm}^2$$

$$P = L_{\text{circum}} + \frac{1}{2} L_{\text{CIRCUM}}$$

$$P = 2\pi \cdot 2 + \frac{2\pi \cdot 4}{2} = 25.13 \text{ dm}$$

c)



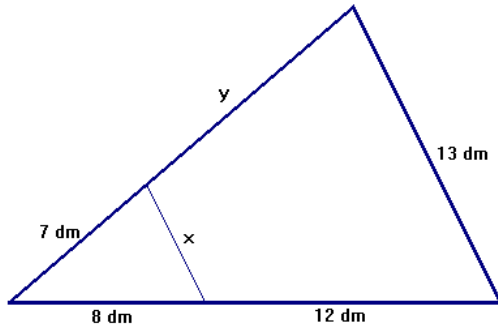
$$A = \pi \cdot 6^2 - \pi \cdot 3^2 = 84.82 \text{ m}^2$$

$$P = L_{\text{circum}} + L_{\text{CIRCUM}}$$

$$P = 2\pi \cdot 3 + 2\pi \cdot 6 = 56.55 \text{ m}$$

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

a)

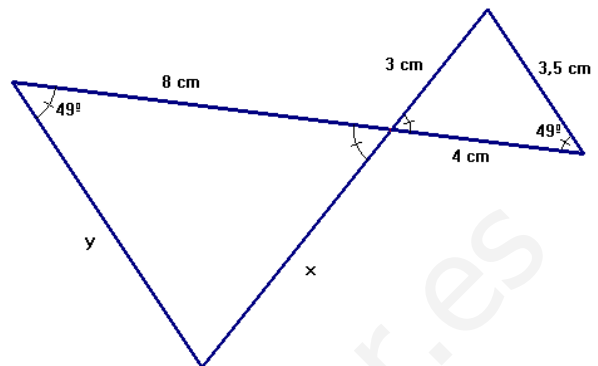


$$\frac{x}{13} = \frac{8}{20} \rightarrow 20x = 104 \rightarrow x = \frac{104}{20} = 5.2 \text{ dm}$$

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

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

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