

ANSWERS

Geometry



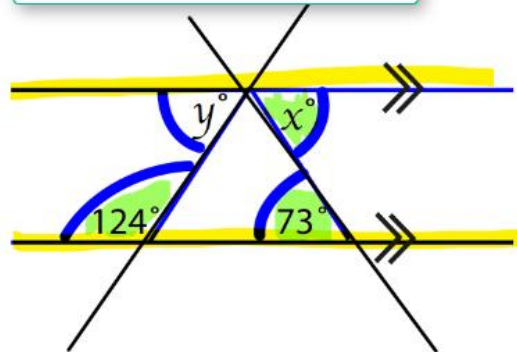
Question 1

Work out

Core 1 - Bronze

Topic:

Geometry



a) $x = 73$

Reason: Alternate

$$180 - 124 = 56$$

b) $y = 56$

Reason: Supplementary



Question 2

Core 2 - Bronze

Topic:

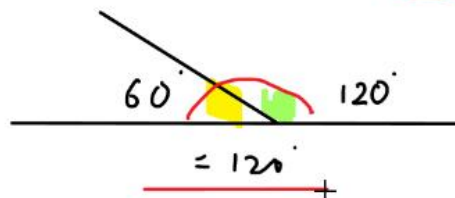
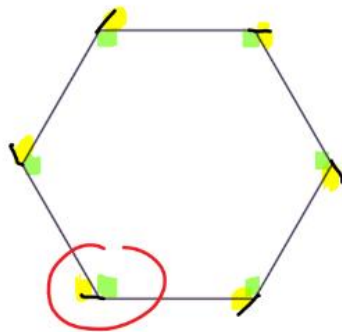
Geometry

a) What is the exterior angle?

Sum of exterior = 360°

One exterior = $\frac{360}{6} = 60^\circ$

b) What is the interior angle?

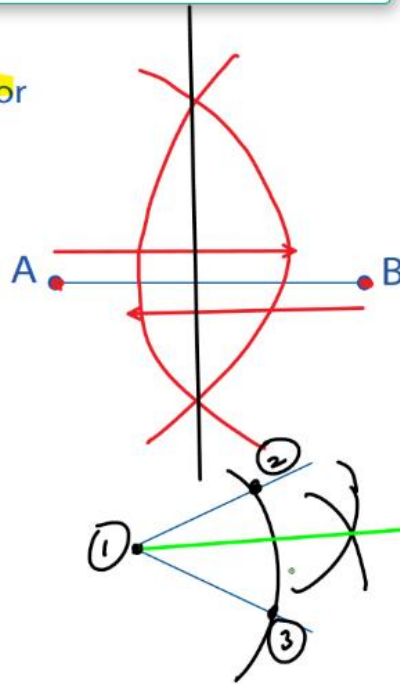


Int + Ext = 180°

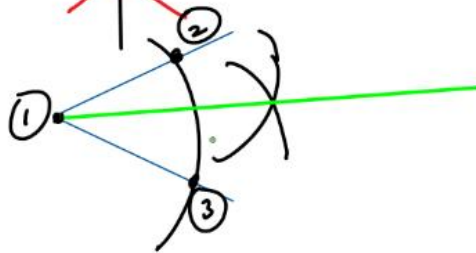


Question 3

a) Draw the **perpendicular bisector** between points A and B.



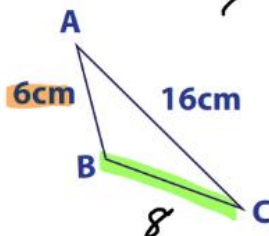
b) Draw the **angle bisector**.



Question 4

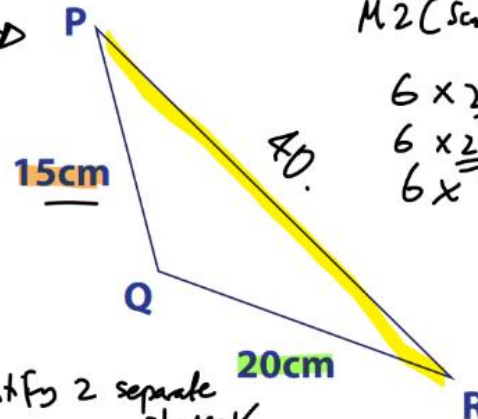
(A)

(B)



Not to Scale

$\times 2.5$



M2 (Scale factor)

$$\begin{aligned} 6 \times 2 &= 12 \\ 6 \times 2.5 &= 15 \\ 6 \times 3 &= 18 \end{aligned}$$

ABC and PQR are similar triangles.

a) Work out the length PR.

b) Work out the length BC.

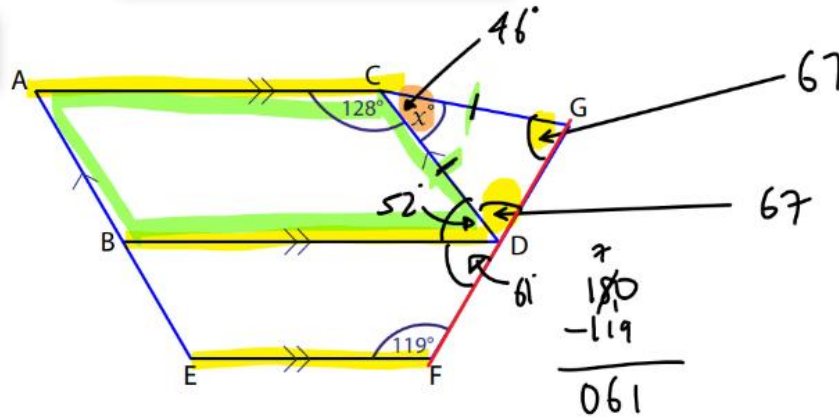
Step 1: Identify 2 separate shapes ✓

Step 2: Calculate scale factor = $\frac{B}{A} = \frac{15}{6} = 2\frac{3}{6} = 2\frac{1}{2} = 2.5$

Step 3: $16 \times 2.5 = 16 \times \frac{25}{10} = \frac{16 \times 25}{10} = \frac{400}{10} = 40$

$$\frac{26 \times 10}{2.5 \times 10} = \frac{260}{25} = 10.4$$

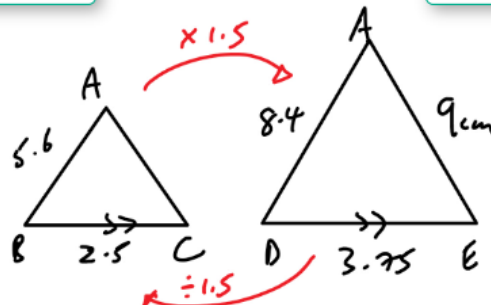
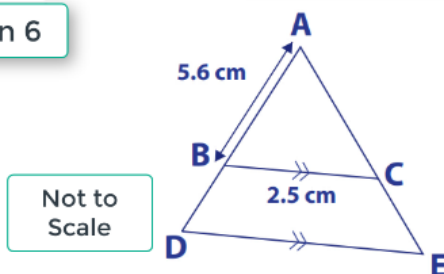
Question 5



AC, BD and EF are parallel lines.
ABCD is a parallelogram
Angle EFD = 119° . Angle ACD = 128°
Work out the size of angle x.
Show all working.

46

Question 6



Triangles ABC and ADE are similar triangles. BC and DE are parallel lines.

$AD = 8.4$, $AB = 5.6$ cm, $BC = 2.5$ cm.

$$\text{Scale factor} = \frac{\text{Largest}}{\text{Smallest}} = \frac{8.4}{5.6} = \frac{84}{56} = \frac{28}{16} = \frac{7}{4} = 1.75$$

a) Work out the length DE.

$$2.5 \times 1.5$$

$$2.5 \times 1.5 = 3.75 \text{ cm (DE)}$$

b) $AE = 9$ cm. Work out length CE.

$$\frac{9}{1.5} = 6$$

$$CE = 3 \text{ cm}$$

Question 7



STEP 1
Identify TWO 3-D
shapes
(Small and Large)

STEP 2
Draw
LAV
table

	A		B
L	3	$\times r$ $\times 2$	6
A	50	$\times r^2$ $\times (2)^2$	200
V	50	$\times r^3$ $\times (2)^3$	400

STEP 3
Complete
'Known'
values
and find 'r'
first.

These two triangular prisms are mathematically similar.
The surface area of A is 50 cm^2 .

a) Find the surface area of B.

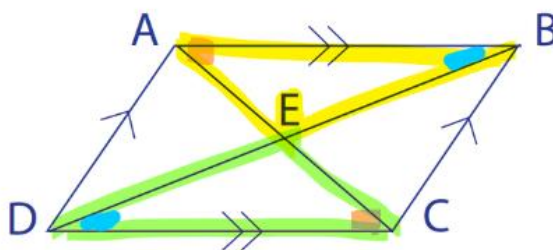
200 cm^2

b) The volume of B is 400 cm^3 . Find the volume of A.

50 cm^3

Question 8

ABCD is a parallelogram.



Step 1: Identify shapes

[Choose Type] Step 2: S: $AB = DC$ [Parallel lines - Parallelogram]
 $\xrightarrow{\text{SSS, SAS, KAS, RHS}}$ $\angle ABE = \angle DCE$ [Alternate angles]
 $\angle BAE = \angle CDE$ [Alternate angles]

Step 3: Justify []

$\therefore$ AAS

E is the point where the diagonals AC and BD meet.
Prove that triangle AEB is congruent to triangle DEC.

Question 9

A regular hexagon is inscribed in a circle. If the perimeter of the hexagon is 30 cm, find:

- The radius of the circle.
- The area of the circle.
- The area of the regular hexagon.

Perimeter of regular polygon

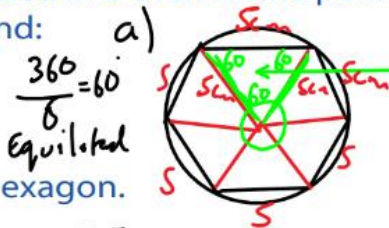
$$P = 2nr \sin\left(\frac{180}{n}\right)$$

$$30 = 2 \times 6 \times r \sin\left(\frac{180}{6}\right)$$

$$30 = 12r \sin(30)$$

$$30 = 12r \times \frac{1}{2} \Rightarrow \frac{30}{1} \times \frac{2}{12} = 0 \quad 60 = 12r$$

$$r = 5 \text{ cm}$$



$$= 5 \text{ cm}$$

$$b) \pi r^2$$

$$\pi \times 5^2$$

$$= 25\pi \text{ cm}^2$$

Topic: Geometry

$$A = \frac{1}{2} nr^2 \sin\left(\frac{360}{n}\right)$$

$$= \frac{1}{2} \times 6 \times 5^2 \times \sin(60)$$

$$= 75 \times \frac{\sqrt{3}}{2}$$

$$= 75\sqrt{3} \text{ cm}^2$$

$$= \frac{1}{2} \times \sin A \times b \times c$$

$$= \frac{1}{2} \times \sin 60 \times 25 = \frac{1}{2} \times \frac{\sqrt{3}}{2} \times \frac{25}{1}$$

$$= \frac{\sqrt{3} \times 25}{4} = \frac{25\sqrt{3}}{4}$$

$$\textcircled{\times 6} \quad \frac{150\sqrt{3}}{4} = \frac{75\sqrt{3}}{2} \text{ cm}^2$$

Gold



Question 10

Solid A and Solid B are mathematically similar.

The ratio of the surface area of solid A to the surface area of solid B is 4:25.

The volume of B is 1250 cm^3 .

Show that the volume of A is 80 cm^3 .

	A		B
L		$\left(\frac{5}{3}\right)$ $\times r$	
A	4	$\left(\frac{25}{12}\right)$ $\times r^2$	25
V		$\left(\frac{125}{8}\right)$ $\times r^3$	1250

$$\frac{1250}{1} \div \frac{125}{8}$$

$$\frac{1250}{1} \times \frac{8}{125} = \frac{10}{1} \times \frac{8}{1} = 80 \text{ cm}^3$$

Core 10 - Platinum

Topic: Geometry