SIMILAR TRIANGLES

NC

12. (a) Explain clearly why the following triangles are **NOT** similar.

C

88°

62°

A                    B

P

35°

Q                    R

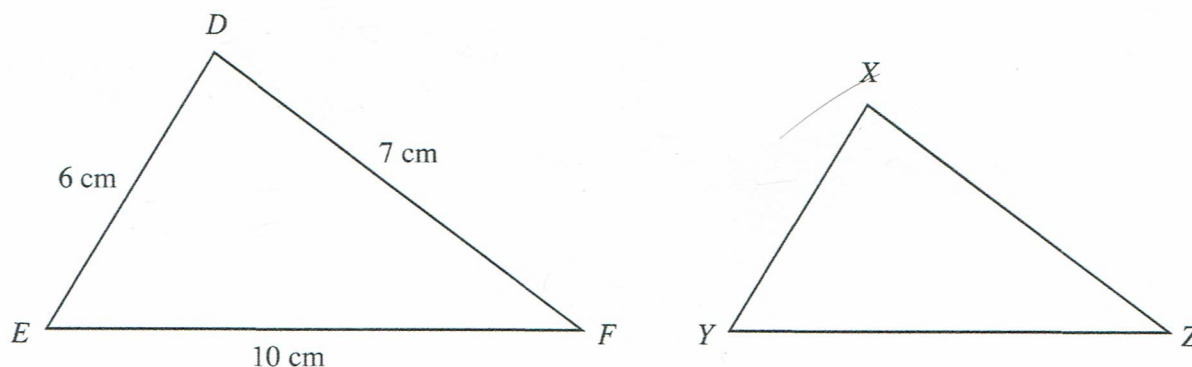*Diagrams not drawn to scale.*

88
62
35

185

1
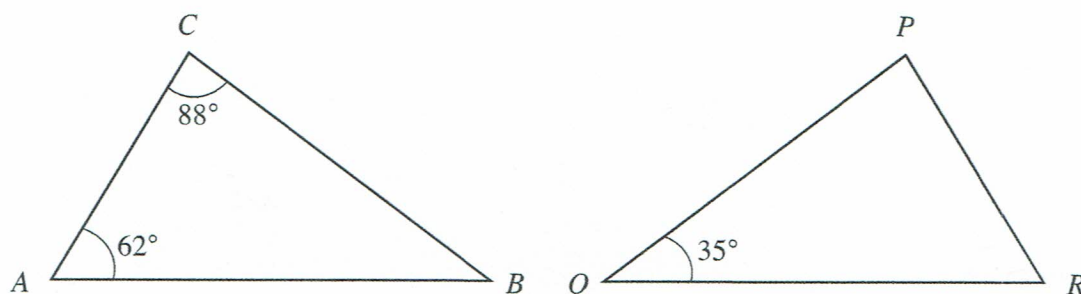
For the triangles to be similar all the angles must be the same as the corresponding angles in the other triangle. This would mean that angle B would be 35°, for this to be true

$88 + 62 + 35 = 180°$

$but = 185°$

[2]

(b) Triangles *DEF* and *XYZ* are similar. Their corresponding sides are in the ratio 4:3. Calculate the length of *YZ*.

D

6 cm

7 cm

E                    F

10 cm

X

Y                    Z

*Diagrams not drawn to scale.*

4 : 3

×?

10 : YZ    ×2·5

$10 ÷ 4 = 2·5$

$YZ = 3 × 2·5 = 7·5 cm$

[2]

(184/09)                                        **Turn over.**

**16.** *(a)* Explain clearly why triangles *ABC* and *XYZ* are similar.

C

9 cm

15 cm

A

18 cm

B

Z

6 cm

10 cm

X

12 cm

Y
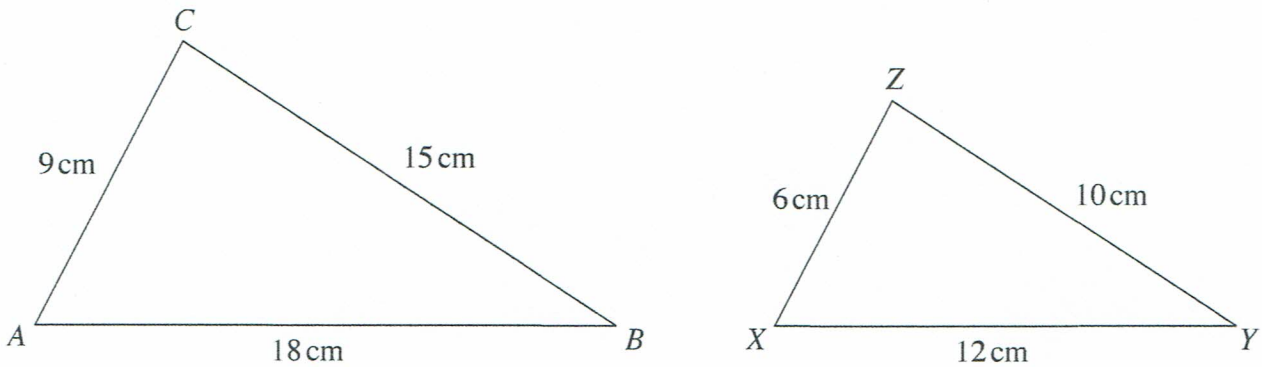
*Diagrams not drawn to scale.*

If Δ's are similar, then corresponding sides will be in the same ratio:

$$9 : 6 \qquad 18 : 12 \qquad 15 : 10$$
$$= 3 : 2 \qquad = 3 : 2 \qquad 3 : 2 \qquad \checkmark$$

[2]

*(b)* Triangle *PQR*, in which *PQ* = 15 cm, is similar to both triangles *ABC* and *XYZ*. Calculate the length of *QR*.
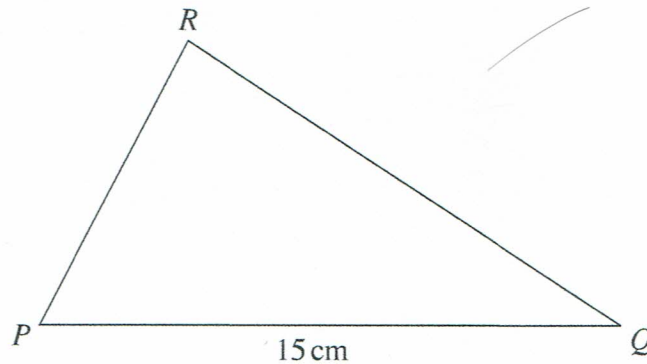
R

P

15 cm

Q

*Diagram not drawn to scale.*

Compare to ΔXYZ

$$12 : 15 \qquad 4 : 5 \qquad \Big\} \times 2.5$$
$$10 : RQ \qquad 10 : RQ$$
$$10 \div 4 = 2.5$$

$$RQ = 2.5 \times 5$$
$$= 12.5 \text{ cm}$$

[2]

**Turn over.**
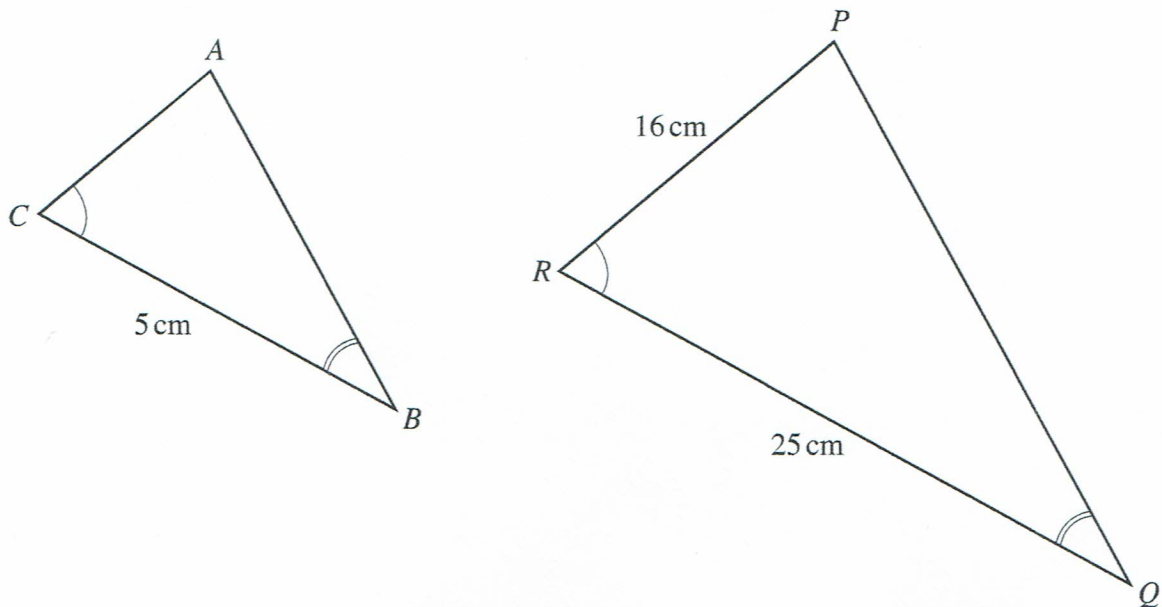
**12.** The diagram shows two similar triangles, *ABC* and *PQR*.
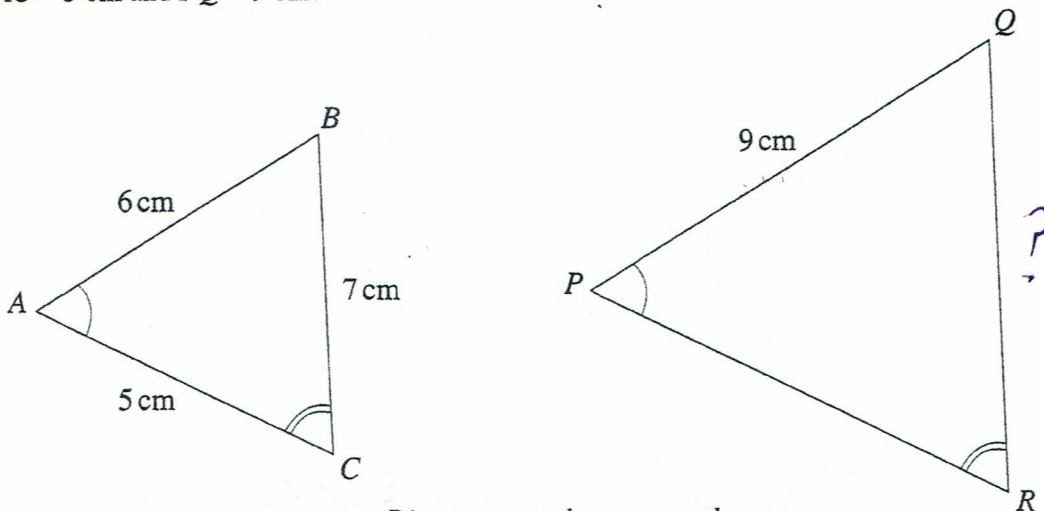


*Diagram not drawn to scale.*

Given that *CB* = 5 cm, *RQ* = 25 cm and *PR* = 16 cm, find the length of *AC*.

$$5 : 25 \qquad 1 : 5 \qquad \frac{3.2}{5 | 16.^{1}0}$$

$$?6 \qquad \Big]x?\,3.2$$

$$AC : 16 \qquad AC : 16$$

$$AC = 1 \times 3.2 = 3.2 \text{ cm}$$

[2]

**16.** Triangles *ABC* and *PQR* are similar, with $B\hat{A}C = Q\hat{P}R$, $B\hat{C}A = Q\hat{R}P$, *AB* = 6 cm, *BC* = 7 cm, *AC* = 5 cm and *PQ* = 9 cm.



*Diagrams not drawn to scale.*

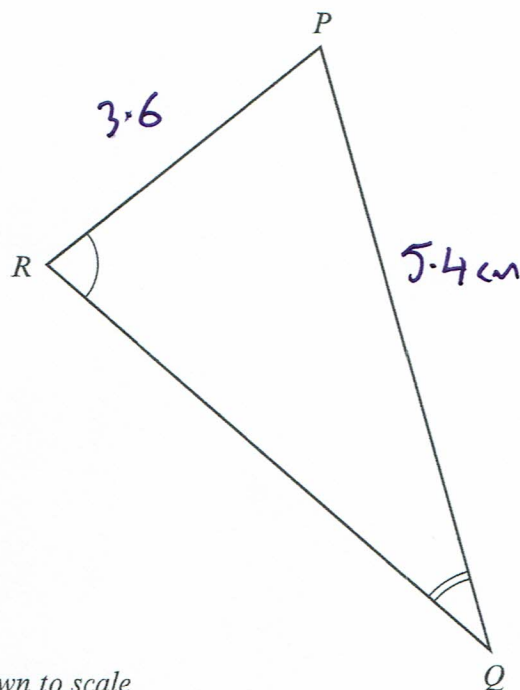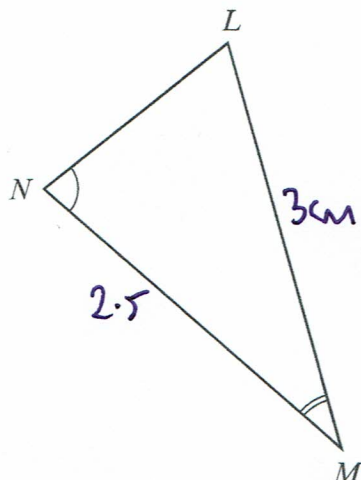Showing all your working, find the length of *QR*.

$$6 : 9 \Rightarrow 2 : 3 \qquad \frac{3.5}{\times 3}$$

$$\Big(x? \qquad \Big)\times 3.5 \qquad \frac{\times 3}{10.5}$$

$$7 : QR \qquad 7 : QR \qquad QR = 10.5 \text{ cm}$$

$$7 \div 2 = 3.5$$

[2]

(CALc oK)

9. Triangles *LMN* and *PQR* are similar.



L

N

3cm

2·5

M

P

3·6

R

5·4 cm

Q

*Diagrams not drawn to scale*

$LM = 3$ cm, $MN = 2·5$ cm, $PR = 3·6$ cm and $PQ = 5·4$ cm.
Showing all your working, find the length of

(a)  *RQ*,

$x? \begin{cases} 3 : 5.4 \\ 2.5 : RQ \end{cases} \times \frac{5}{6}$

$RQ = 5.4 \times \frac{5}{6} = 4.5 cm$

$2.5 \div 3 = \frac{5}{6}$

[2]

(b)  *LN*.

$\frac{2}{3} \times \begin{cases} 3 : 5.4 \\ LN : 3.6 \end{cases} \times ?$

$3.6 \div 5.4 = \frac{2}{3}$    So $LN = 3 \times \frac{2}{3} = 2 cm$

[2]