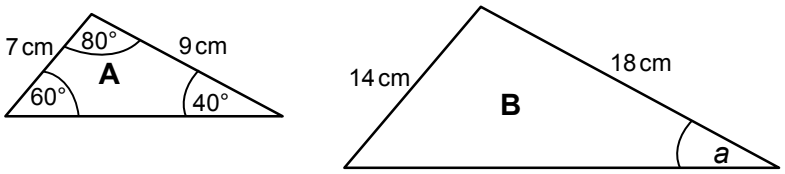
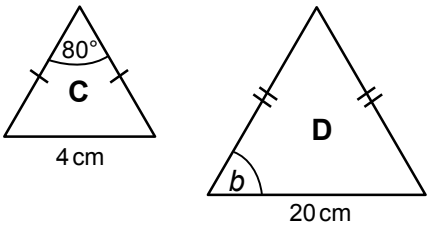
Topic Check In - 9.04 Similarity

1. Triangles **A** and **B** are similar.
   Work out angle *a*.

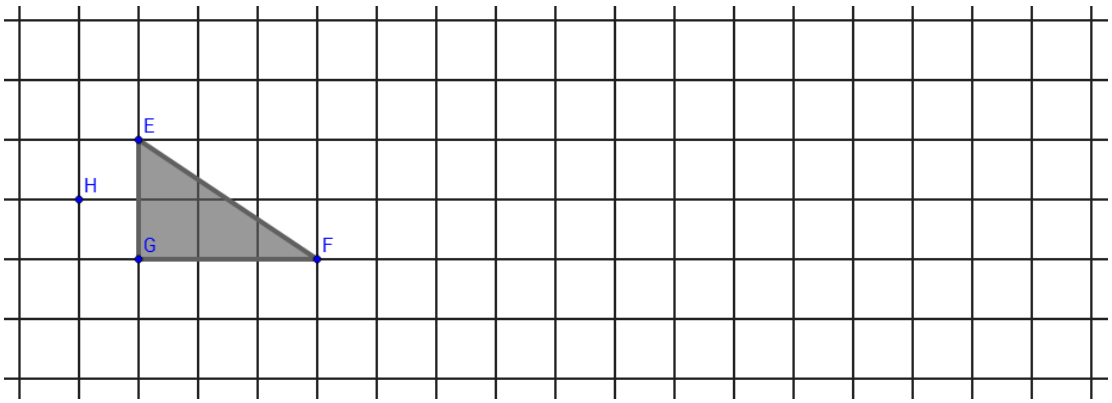


2. Triangles **C** and **D** are similar. Work out angle *b*.

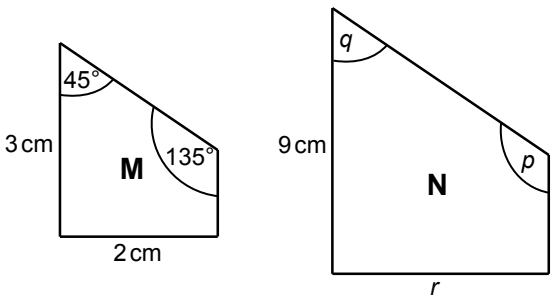


3. Complete the sentence.
   "Similar shapes have the same ……"

4. Enlarge triangle EFG by scale factor 2 about the centre of enlargement H.



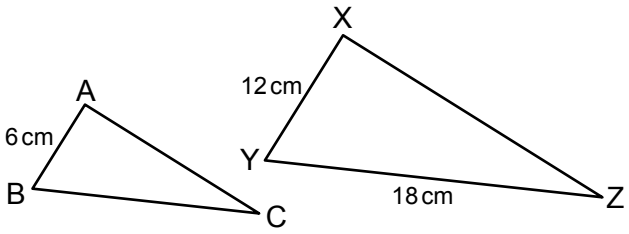
5. Shape **M** is enlarged to produce shape **N**.
   What is the scale factor of the enlargement?



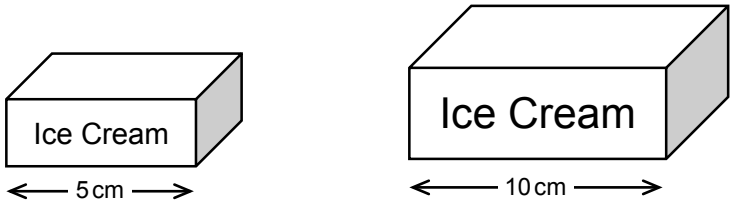
6. For shape **N** in the diagram above, find angle *q* and length *r*.
   Give a reason for each answer.

7. Triangle ABC is enlarged to give triangle XYZ.
Complete the ratio of lengths.

AB : XY = ….. : YZ = AC : …..



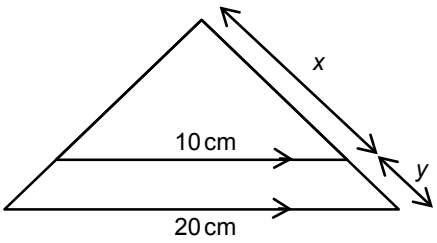
8. The ice cream cartons shown below are similar shapes.



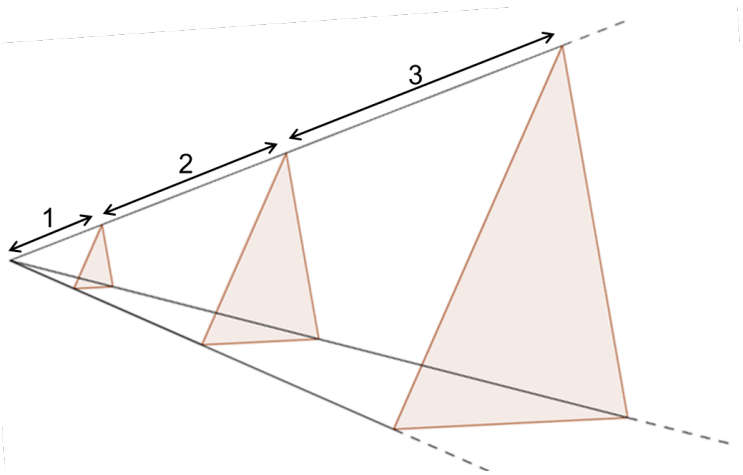
Simon says, “The scale factor of the lengths is 2, so the large carton holds twice as much ice cream as the small carton”.

Explain why Simon is wrong.

9. What is the ratio of x : y?



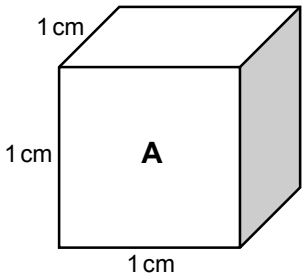
10. This diagram shows part of a pattern of increasing triangles. What is the scale factor of enlargement that maps the first triangle onto the fourth triangle?



Extension

Cubes **B**, **C** and **D** are enlargements of cube **A**.

Cube **B** is enlarged by a scale factor of 2.
Cube **C** is enlarged by a scale factor of 3.
Cube **D** is enlarged by a scale factor of 4.



Complete the table for cubes **A**, **B**, **C** and **D**.

	Units	A	B	C	D
Length of side	cm	1	2	3	4
Area of one face					
Total surface area					
Volume					

a) What scale factors map cube **B** onto cube **D** for (i) length, (ii) area and (iii) volume?

b) What scale factors map cube **A** onto cube **C** for (i) length, (ii) area and (iii) volume?

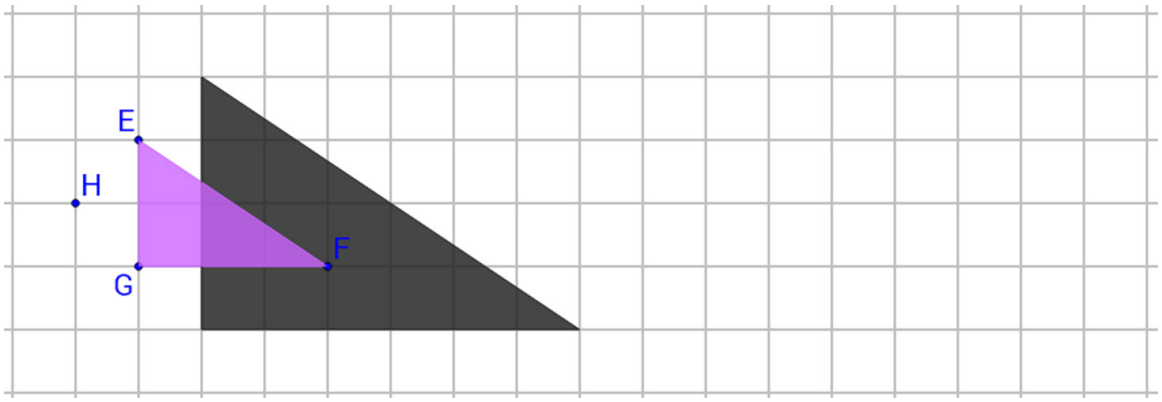
Answers

1. 40°

2. 50°

3. “angles”

4. From diagram



5. Scale factor 3

6. q = 45°, corresponding angles are the same; r = 6 cm, scale factor of 3

7. AB : XY BC : YZ AC : ZX

8. 8 small cartons would fit into the big carton so large carton would hold 8 times as much ice cream as the small carton.

9. 1 : 1

10. 10

Extension

	Units	A	B	C	D
Length of side	cm	1	2	3	4
Area of one face	cm^2	1	4	9	16
Total surface area	cm^2	6	24	54	96
Volume	cm^3	1	8	27	64

a) (i) length SF × 2 (or 2^1) (ii) area SF × 4 (or 2^2) (iii) volume SF × 8 (or 2^3)

b) (i) length SF × 3 (or 3^1) (ii) area SF × 9 (or 3^2) (iii) volume SF × 27 (or 3^3)

GCSE (9–1) MATHEMATICS

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Angles in similar triangles.			
AO1	2	Angles in similar isosceles triangles.			
AO1	3	Definition of similar shapes.			
AO1	4	Enlarge a shape about a given point.			
AO1	5	Find scale factor of similar shapes.			
AO2	6	Find missing lengths and angles in pairs of similar triangles.			
AO2	7	Identify corresponding sides in pairs of similar triangles.			
AO2	8	Use scale factor in context.			
AO3	9	Compare ratio of sides in similar triangle diagram.			
AO3	10	Identify scale factor in an enlargement problem.			

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