

11.4 Answers

GCSE Mathematics Ratio and Similarity

11.4.1 Solutions to 11.2 Orientation Examples

- (i) $\frac{10}{4} = \frac{15}{6}$ which both cancel down to $\frac{5}{2}$
- (ii) Yes, because $\frac{15}{5} = \frac{12}{4} = \frac{9}{3}$ which all cancel down to $\frac{3}{1}$
- (iii) Second and last as $\frac{15}{10} = \frac{12}{8} = \frac{9}{6}$ which all cancel down to $\frac{3}{2}$
- [2, 2, 2 marks]

11.4.2 Solutions to 11.3 Exercise

Answer 1

- A Not similar because $\frac{20}{5} \neq \frac{15}{3}$
- B Similar because $\frac{25}{5} = \frac{20}{4}$ which both cancel to $\frac{5}{1}$
- C Similar because $\frac{72}{9} = \frac{48}{6}$ which both cancel to $\frac{8}{1}$
- D Not similar because $\frac{49}{7} \neq \frac{36}{6}$
- [2, 2, 2, 2 marks]

Answer 2

- (i) $lsf = \frac{7}{5}$ (ii) $vsf = \frac{343}{125}$ (iii) 686 cm^3
- [1, 1, 1 marks]

Answer 3

The $lsf = \frac{10}{7}$ $\therefore x = \frac{10}{7} \times 3.5 = 5 \text{ cm}$

[2 marks]

Answer 4

- (i) All cubes have the same **shape** (but can be of different sizes). [1 mark]
- (ii) 4 [1 mark]
- (iii) 16 [1 mark]
- (iv) 320 cm^2 [1 mark]

Answer 5

(i)	$\frac{8}{5}$	(ii)	$\frac{5}{8}$	1.6	0.625
(iii)	$\frac{64}{25}$	(iv)	$\frac{25}{64}$	2.56	0.390625
(v)	$\frac{512}{125}$	(iv)	$\frac{125}{512}$	4.096	0.244140625

[1 mark each, 6 marks total]**Answer 6**

$$3^2 \times 4 = 36 \text{ cm}^2$$

[2 marks]**Answer 7**

(a)	T	(f)	F
(b)	T	(g)	F
(c)	T	(h)	T
(d)	F	(i)	T
(e)	T	(j)	F

[1 mark each, 10 marks total]**Answer 8**(i) $\angle BAC$ **[1 mark]**

(ii) $\frac{15}{9} = \frac{5}{3}$

[1 mark](iii) $AB = 10 \text{ cm}$ and $PQ = 7.2 \text{ cm}$ **[2 marks]****Answer 9**

$$asf = \frac{36}{25} \Leftrightarrow lsf = \frac{6}{5} \Leftrightarrow vsf = \frac{216}{125}$$

$$\text{Volume of each large block} = 300 \times \frac{216}{125}$$

$$= 518.4 \text{ cm}^3$$

[3 marks]

Answer 10

$$lsf = \frac{15}{10} = \frac{3}{2} \Leftrightarrow vsf = \frac{27}{8}$$

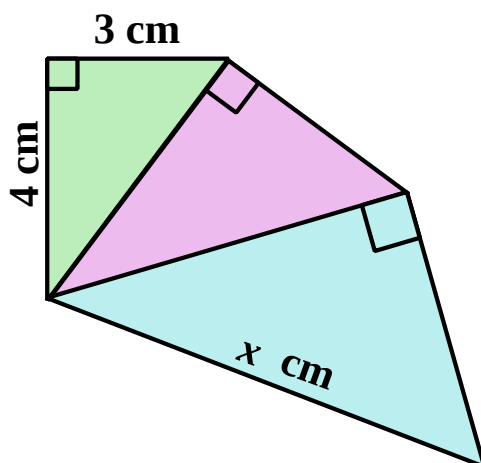
Let the volume of vase **A**, which we are trying to find, be x in which case the volume of vase **B** minus the volume of vase **A** is the 1197 cm^3 given in the question.

$$x \times \frac{27}{8} - x = 1197$$

$$x \times \frac{19}{8} = 1197$$

$$x = 504 \text{ cm}^3$$

[4 marks]

Answer 11

By the theorem of Pythagoras, the hypotenuse of the green triangle is 5 cm.

Between the green and the pink triangle this gives $lsf = \frac{5}{4}$

Consequently, the blue triangle has a hypotenuse given by,

$$4 \times \left(\frac{5}{4} \right)^3 = \frac{125}{16} \text{ cm (As a decimal: 7.8125 cm)}$$

[4 marks]