



THIRD SPACE
LEARNING

GCSE Exam Questions

Simplifying and Equivalent
Ratios | Ratio & Proportion

GCSE Exam Questions: Simplifying and Equivalent Ratios

- 1) (a) In a game of basketball, you can win, lose or draw.

In 24 games, the team won three times as many games than they lost.

They drew 4 games.

Write the ratio of wins to losses to draws in the simplest form.

(2)

- (b) After the next game, the ratio is 3:1:1.

What was the result of the game?

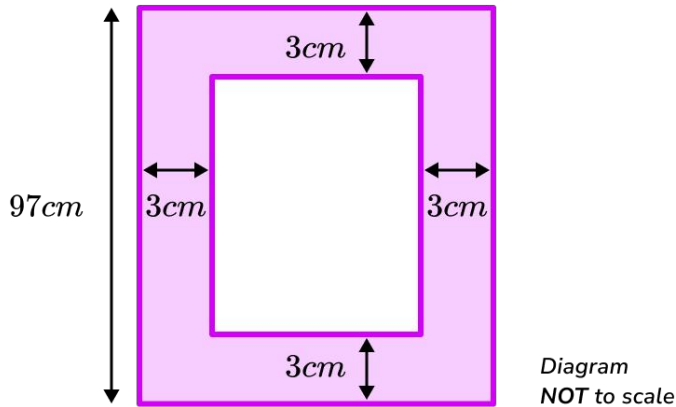
(4)
(6 marks)

GCSE Exam Questions: Simplifying and Equivalent Ratios

- 2) (a) A glass inside a window frame has dimensions in the ratio of height to width of 7:4.

The window frame has an outside height of 97cm .

If the frame is 3cm wide, what is the width of the window frame?



(4)

- (b) Glass is made from mixing sand, limestone and sodium carbonate in the ratio 18:3:4.

What percentage of the glass is made from limestone?

(3)
(7 marks)

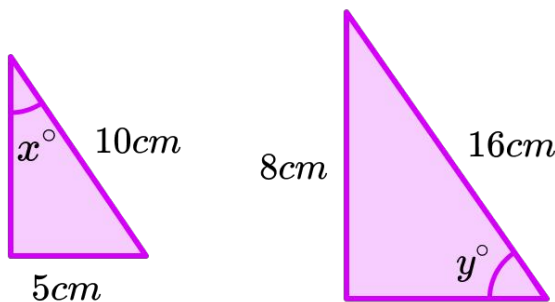
GCSE Exam Questions: Simplifying and Equivalent Ratios

- 3) (a) A right angle triangle has a base of 4cm and a height of 9cm .
 Another right angle triangle has a base of 10cm and a height of 22cm .
 Are the triangles similar? Explain your answer.

(3)

- (b) The sine ratio is the ratio of the length of the opposite side divided by the hypotenuse of a right angle triangle. This is written as $\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$ where θ is the included angle.

Show that $\sin(x) = \sin(y)$.



(3)

(6 marks)

GCSE Exam Questions: Simplifying and Equivalent Ratios

- 4) (a) A television has an aspect ratio width : height of 16:9.

The diagonal length of the television is 27.54 inches.

What is the width of the television?

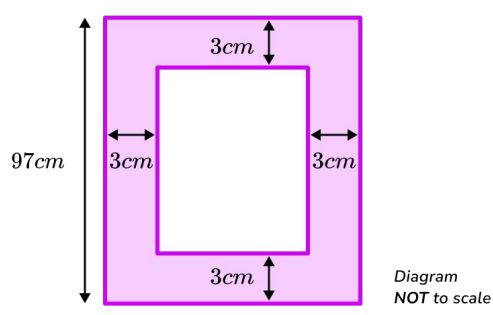
(3)

- (b) The area of the screen for a different television with the same aspect ratio is 900 square inches.

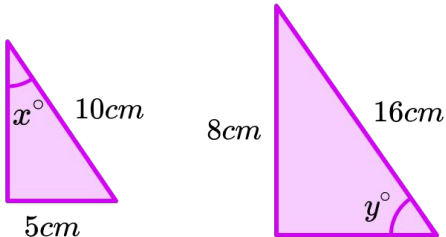
What is the width of the television?

(4)
(7 marks)

GCSE Exam Questions: Simplifying and Equivalent Ratios Answers

	Question	Answer	Marks
1) (a)	In a game of basketball, you can win, lose or draw. In 24 games, the team won three times as many games than they lost. They drew 4 games. Write the ratio of wins to losses to draws in the simplest form.	(a) $20 \times 0.75 = 15$ $15:5:4$	(1) (1)
(b)	After the next game, the ratio is 3:1:1. What was the result of the game?	(b) 25 games and $3 + 1 + 1 = 5$ $25 \div 5 = 5$ $15:5:5$ Draw	(1) (1) (1) (1)
2) (a)	<p>A glass inside a window frame has dimensions in the ratio of height to width of 7:4. The window frame has an outside height of 97cm. If the frame is 3cm wide, what is the width of the window frame?</p>  <p style="text-align: right; font-size: small;">Diagram NOT to scale</p>	(a) $97 - 6 = 91$ $91 \div 7 = 13$ $13 \times 4 = 52$ $52 + 6 = 58\text{cm}$	(1) (1) (1) (1)
(b)	Glass is made from mixing sand, limestone and sodium carbonate in the ratio 18:3:4. What percentage of the glass is made from limestone?	(b) $18 + 3 + 4 = 25$ $100 \div 25 = 4$ $4 \times 3 = 12\%$	(1) (1) (1)

GCSE Exam Questions: Simplifying and Equivalent Ratios Answers

	Question	Answer	Marks
3) (a)	A right angle triangle has a base of 4cm and a height of 9cm . Another right angle triangle has a base of 10cm and a height of 22cm . Are the triangles similar? Explain your answer.	(a) Possible solution: Ratio of bases = $4:10 = 2:5$ Ratio of heights = $9:22$ The ratios are not the same and so the triangles are not similar.	(1) (1) (1)
(b)	<p>The sine ratio is the ratio of the lengths of the opposite side divided by the hypotenuse of a right angle triangle.</p> <p>This is written as $\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$ where θ is the included angle.</p> <p>Show that $\sin(x) = \sin(y)$.</p> 	(b) $\sin(x) = \frac{5}{10} = \frac{1}{2}$ $\sin(y) = \frac{8}{16} = \frac{1}{2}$ The ratio of sides for each triangle is the same and so angle is the same for both triangles.	(1) (1) (1)
4) (a)	A television has an aspect ratio width : height of $16 : 9$. The diagonal length of the television is 27.54 inches. What is the width of the television?	(a) $\sqrt{16^2 + 9^2} = \sqrt{337}$ $27.54 \div \sqrt{337} = 1.500 \text{ (3dp)}$ $16 \times 1.500 = 24 \text{ inches}$	(1) (1) (1)
(b)	The area of the screen for a different television with the same aspect ratio is 900 square inches. What is the width of the television?	(b) $16 \times 9 = 144$ $900 \div 144 = 6.25$ $\sqrt{6.25} = 2.5$ $2.5 \times 16 = 40 \text{ inches}$	(1) (1) (1) (1)

Where to go next?

For more diagnostic questions, and GCSE maths revision resources and worksheets to support students in fixing any misconceptions take a look at the free Third Space Learning [GCSE maths revision](#) pages.

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