



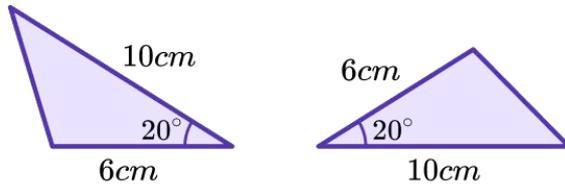
THIRD SPACE
LEARNING

GCSE Exam Questions

Mathematical Proof | Algebra

GCSE Exam Questions: Mathematical Proof

1)



Circle the reason why these triangles are congruent.

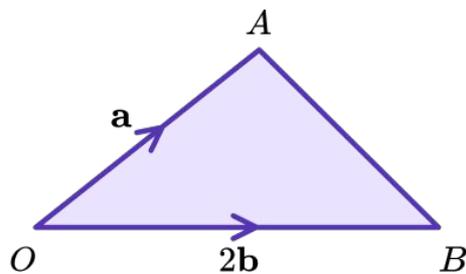
RHS ASA SSS SAS

(1 mark)

- 2) Prove that $(5n + 3)^2 - (5n - 3)^2$ is a multiple of 12, for all positive integer values of n .

(3 marks)

3)



$$\vec{OA} = a$$

$$\vec{OB} = 2b$$

Q is the point on AB such that $AQ:QB = 3:2$

$$\vec{OQ} = k(a + 3b)$$

Find the value of k

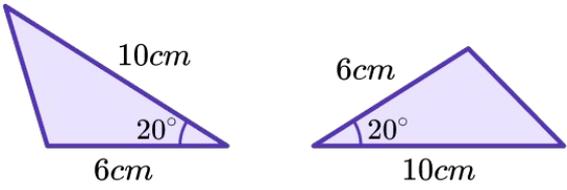
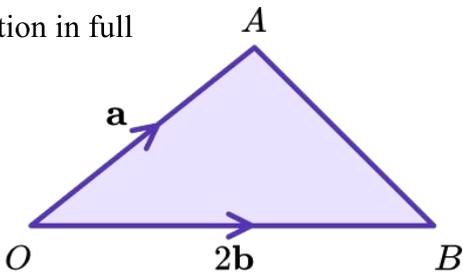
(4 marks)

GCSE Exam Questions: Mathematical Proof

- 4) Prove algebraically that the difference between the squares of any two consecutive odd numbers is equal to twice the sum of these two integers.

(5 marks)

GCSE Exam Questions: Mathematical Proof Answers

	Question	Answer	Marks
1)	 <p>Circle the reason why these triangles are congruent.</p> <p>RHS ASA SSS SAS</p>	SAS	(1)
2)	Prove that $(5n + 3)^2 - (5n - 3)^2$ is a multiple of 12, for all positive integer values of n .	$(5n + 3)^2 - (5n - 3)^2$ $= 25n^2 + 30n + 9 - (25n^2 - 30n + 9)$ $= 25n^2 + 30n + 9 - 25n^2 + 30n - 9 = 60n$ $= 12 \times 5n \text{ and multiple of 12}$	(1) (1) (1)
3)	<p>Question in full</p>  <p>$\vec{OA} = a$ $\vec{OB} = 2b$</p> <p>Q is the point on AB such that $AQ:QB = 3:2$</p> <p>$\vec{OQ} = k(a + 3b)$</p> <p>Find the value of k.</p>	$\vec{AB} = -a + 2b$ $\vec{AQ} = \frac{3}{5}(-a + 2b)$ $\vec{OQ} = a + \frac{3}{5}(-a + 2b)$ $= \frac{2}{5}a + \frac{6}{5}b$ $= \frac{2}{5}(a + 3b)$ $k = \frac{2}{5}$	(1) (1) (1) (1)
4)	Prove algebraically that the difference between the squares of any two consecutive odd numbers is equal to twice the sum of these two integers.	$(2n + 1)^2 - (2n - 1)^2$ $= 4n^2 + 4n + 1 - (4n^2 - 4n + 1)$ $= 4n^2 + 4n + 1 - 4n^2 + 4n - 1$ $= 8n$ $2n + 1 + 2n - 1 = 4n$ $4n \times 2 = 8n$	(1) (1) (1) (1) (1)

Where to go next?

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