



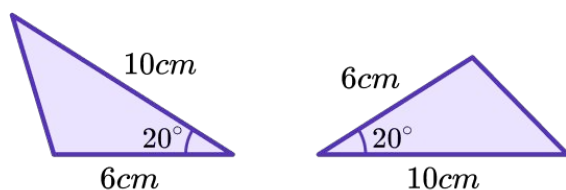
THIRD SPACE
LEARNING

GCSE Exam Questions

Mathematical Proof | Algebra

GCSE Exam Questions: Mathematical Proof

1)



Circle the reason why these triangles are congruent.

RHS

ASA

SSS

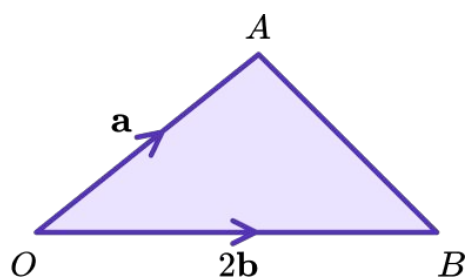
SAS

(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)



$$\overrightarrow{OA} = a$$

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

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

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

Find the value of k

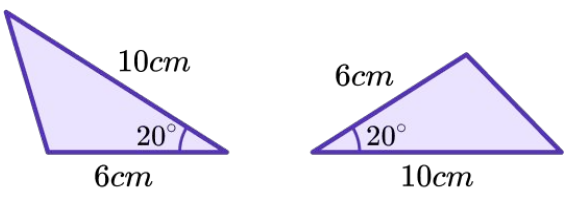
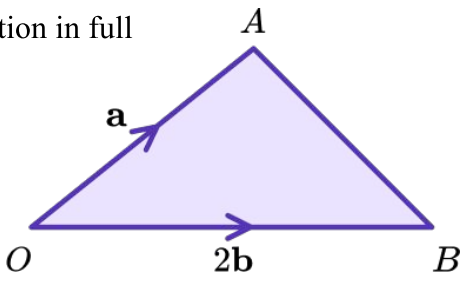
(4 marks)

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

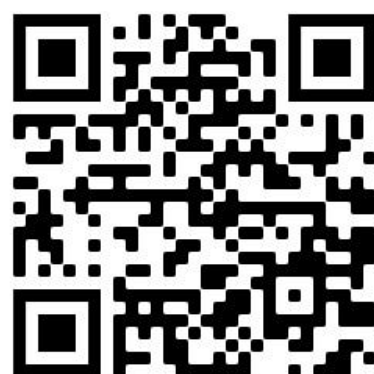
	Question	Answer	Marks
1)	 <p>Circle the reason why these triangles are congruent.</p> <p>RHS ASA SSS SAS</p>	SAS	(1)
2)	Prove that $(5n + 3)^2 - (5n - 3)^2$ is a multiple of 12, for all positive integer values of n .	$(5n + 3)^2 - (5n - 3)^2$ $= 25n^2 + 30n + 9 - (25n^2 - 30n + 9)$ $= 25n^2 + 30n + 9 - 25n^2 + 30n - 9 = 60n$ $= 12 \times 5n \text{ and multiple of 12}$	<p>(1)</p> <p>(1)</p> <p>(1)</p>
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>	$\vec{AB} = -a + 2b$ $\vec{AQ} = \frac{3}{5}(-a + 2b)$ $\vec{OQ} = a + \frac{3}{5}(-a + 2b)$ $= \frac{2}{5}a + \frac{6}{5}b$ $= \frac{2}{5}(a + 3b)$ $k = \frac{2}{5}$	<p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p>
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.	$(2n + 1)^2 - (2n - 1)^2$ $= 4n^2 + 4n + 1 - (4n^2 - 4n + 1)$ $= 4n^2 + 4n + 1 - 4n^2 + 4n - 1$ $= 8n$ $2n + 1 + 2n - 1 = 4n$ $4n \times 2 = 8n$	<p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p>

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.

Scan the QR code to discover our library of FREE GCSE maths revision resources

Do you have KS4 students who need additional support in maths?



Our specialist tutors will help students to develop the skills they need to succeed at GCSE in weekly one to one online revision lessons. Trusted by secondary schools across the UK.

Visit thirdspacelearning.com to find out more.