



A Level Maths

Topic: Gradient and Perpendicular Lines

Instructions

Answer all questions. Show complete working. Use the appropriate methods to find the gradient and the equation of perpendicular lines.

Practice Questions

1. Find the gradient of the line passing through the points $(2, 3)$ and $(5, 7)$.
2. Find the gradient of the line that passes through the points $(-1, 4)$ and $(3, -2)$.
3. Find the equation of the line passing through the point $(1, 2)$ and having a gradient of 4.
4. Given the line with the equation $3x - 2y = 6$, find its gradient.
5. Find the gradient of the line passing through $(0, 1)$ and $(2, 5)$.
6. Two lines have gradients $m_1 = 3$ and $m_2 = -\frac{1}{3}$. Are the lines perpendicular? Justify your answer.
7. If the gradient of one line is $m = 2$, find the gradient of a line that is perpendicular to it.
8. Find the equation of the line that is perpendicular to the line $2x - 3y = 5$ and passes through the point $(4, -1)$.
9. If two lines have gradients $m_1 = 5$ and $m_2 = -\frac{1}{5}$, are they perpendicular? Show how you arrived at your conclusion.
10. Find the equation of the line passing through $(3, -2)$ and perpendicular to the line $y = 2x + 3$.

Multiple-Choice Questions

1. The gradient of the line passing through the points $(2, 5)$ and $(4, 9)$ is:
 - A. 2
 - B. 1
 - C. $\frac{1}{2}$
 - D. 3
2. If two lines have gradients $m_1 = 4$ and $m_2 = -\frac{1}{4}$, what is the relationship between them?
 - A. They are parallel.
 - B. They are perpendicular.
 - C. They are not related.
 - D. They are intersecting at an acute angle.
3. The gradient of the line passing through the points $(1, 2)$ and $(3, 6)$ is:
 - A. 2
 - B. 4
 - C. 1
 - D. 0
4. Which of the following is the equation of a line with gradient $m = -3$ passing through the point $(2, -4)$?
 - A. $y + 4 = -3(x - 2)$
 - B. $y - 4 = -3(x - 2)$
 - C. $y + 4 = 3(x - 2)$
 - D. $y + 4 = 3(x + 2)$
5. If two lines are perpendicular, and the gradient of the first line is $m_1 = 2$, what is the gradient of the second line?
 - A. $m_2 = -2$
 - B. $m_2 = \frac{1}{2}$
 - C. $m_2 = -\frac{1}{2}$
 - D. $m_2 = 2$

Visit our website: [Mathaversity.com](https://mathaversity.com)