GCSE (1 – 9)

The Gradient of a Line

Instructions

• Use black ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
  – there may be more space than you need.
• Diagrams are NOT accurately drawn, unless otherwise indicated.
• You must show all your working out.

Information

• The marks for each question are shown in brackets
  – use this as a guide as to how much time to spend on each question.

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end
1. The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

(Total for question 1 is 1 mark)

2. The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

(Total for question 2 is 1 mark)
3. The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

(Total for question 3 is 1 mark)

4. The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

(Total for question 4 is 1 mark)
5 The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

\[ \frac{1}{2} \]

(Total for question 5 is 1 mark)

6 The line $L$ is drawn on the grid below.

Find the gradient of the line $L$.

\[ -1 \]

(Total for question 6 is 1 mark)
7. Find the gradient of the line that passes through \((2, 1)\) and \((5, 10)\).

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 1}{5 - 2} = \frac{9}{3} = 3
\]

(Total for question 7 is 2 marks)

8. Find the gradient of the line that passes through \((5, 4)\) and \((7, 0)\).

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 4}{7 - 5} = \frac{-4}{2} = -2
\]

(Total for question 8 is 2 marks)

9. Find the gradient of the line that passes through \((-3, 4)\) and \((5, 8)\).

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 4}{5 - (-3)} = \frac{4}{8} = \frac{1}{2}
\]

(Total for question 9 is 2 marks)
10  Find the gradient of the line that passes through (3, 7) and (1, 10).

\[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 7}{1 - 3} = \frac{3}{-2} = -1.5 \]

(Total for question 10 is 2 marks)

11  Find the gradient of the line that passes through (1, -1) and (-3, -9).

\[ m = \frac{-9 - (-1)}{-3 - 1} = \frac{-8}{-4} = 2 \]

(Total for question 11 is 2 marks)

12  Find the gradient of the line that passes through (8, 1) and (3, -3).

\[ m = \frac{-3 - 1}{3 - 8} = \frac{-4}{-5} = \frac{4}{5} \]

(Total for question 12 is 2 marks)
13 Find the gradient of the line that passes through (3, -1) and (-2, 9).

\[
m = \frac{9 - (-1)}{-2 - 3} = \frac{10}{-5} = -2
\]

(Total for question 13 is 2 marks)

14 Find the gradient of the line that passes through (-1, -2) and (-3, 10).

\[
m = \frac{10 - (-2)}{-3 - (-1)} = \frac{12}{-2} = -6
\]

(Total for question 14 is 2 marks)

15 Find the gradient of the line that passes through (-3, 4) and (-5, 7).

\[
m = \frac{7 - 4}{-5 - (-3)} = \frac{3}{-2} = -1.5
\]

(Total for question 15 is 2 marks)
16. The line $AB$ passes through the points $A(2, -1)$ and $(6, k)$. 

The gradient of $AB$ is 5.

Work out the value of $k$.

$$5 = \frac{k - (-1)}{6 - 2}$$

$$5 = \frac{k + 1}{4}$$

$$20 = k + 1$$

$$k = 19$$

(Total for question 16 is 3 marks)

17. The line $AB$ passes through the points $A(-3, 4)$ and $(k, 12)$.

The gradient of $AB$ is 4.

Work out the value of $k$.

$$4 = \frac{12 - 4}{k - (-3)}$$

$$4 = \frac{8}{k + 3}$$

$$4(k + 3) = 8$$

$$k + 3 = 2$$

$$k = -1$$

(Total for question 17 is 3 marks)

18. The line $AB$ passes through the points $A(-2, k)$ and $(4, 8)$.

The gradient of $AB$ is -2.

Work out the value of $k$.

$$-2 = \frac{8 - k}{4 - (-2)}$$

$$-2 = \frac{8 - k}{6}$$

$$-12 = 8 - k$$

$$-12 + k = 8$$

$$k = 20$$

(Total for question 18 is 3 marks)