



5.14F Gradient of a Line: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out the gradient of the line that passes through the points (1, 3) and (4, 6).

(Total for Question 1 is 1 mark)

- 2** Find the gradient of the line joining the points (2, 5) and (2, 9).

(Total for Question 2 is 1 mark)

- 3** Calculate the gradient of the line that goes through (0, -2) and (5, 3).

(Total for Question 3 is 2 marks)

- 4** Work out the gradient of the line passing through (6, 1) and (2, 5).

(Total for Question 4 is 2 marks)

- 5** A line has gradient 2 and passes through the point (1, 4). Work out the coordinates of the point on this line when $x = 4$.

(Total for Question 5 is 3 marks)

- 6** The line through (3, 7) has gradient -3. Find the equation of the line in the form $y = mx + c$.

(Total for Question 6 is 3 marks)

- 7** A graph shows a straight line. Two clear points on the line are (0, 5) and (5, 5).
Work out the gradient of the line and describe the line (horizontal, vertical or sloping).

(Total for Question 7 is 3 marks)

- 8** Points P(1, 2) and Q(4, -4) are connected by a straight line. Find the gradient and then give the equation of the line in the form $y = mx + c$.

(Total for Question 8 is 4 marks)

- 9** On a coordinate grid, a line goes through (-2, 1) and (2, 3).

(a) Work out the gradient of the line.

(b) Hence or otherwise find the y-intercept.

(a) (a) Work out the gradient of the line.

(2)

(b) (b) Hence or otherwise find the y-intercept.

(2)

(Total for Question 9 is 4 marks)

Mark scheme · 5.14F Gradient of a Line: Foundation Tier Practice

Question 1

- **B1** gradient = $(6 - 3)/(4 - 1) = 3/3 = 1$ cao
- **Answer:1** (gradient = 1)

Working check: change in $y = 6 - 3 = 3$, change in $x = 4 - 1 = 3$ so gradient = $3/3 = 1$.

Question 2

- **B1** vertical line has undefined gradient; state 'undefined' or 'no gradient' oe
- **Answer:Undefined**
(The line is vertical so the gradient is undefined.)

Working check: change in $x = 2 - 2 = 0$ so gradient = $(9 - 5)/0$ which is not defined.

Question 3

- **M1** correct method: $(3 - (-2))/(5 - 0) = 5/5$ or equivalent
- **A1** 1 cao
- **Answer:1** (gradient = 1)

Working check: change in $y = 3 - (-2) = 5$, change in $x = 5 - 0 = 5$, gradient = $5/5 = 1$.

Question 4

- **M1** use $(5 - 1)/(2 - 6) = 4/(-4)$ or equivalent
- **A1** -1 cao
- **Answer:-1** (gradient = -1)

Working check: change in $y = 5 - 1 = 4$, change in $x = 2 - 6 = -4$, gradient = $4/(-4) = -1$.

Question 5

- **M1** use $y - 4 = 2(x - 1)$ or $y = 2x + b$ and substitute to find b
- **M1** substitute $x = 4$ to find $y = 2*4 + b$ or use point-slope to get $y = 10$
- **A1** final coordinates (4, 10) cao
- **Answer:(4, 10)**

Working check: equation $y - 4 = 2(x - 1) \Rightarrow y - 4 = 2x - 2 \Rightarrow y = 2x + 2$. For $x = 4$, $y = 2*4 + 2 = 10$.

Question 6

- **M1** use point-slope: $y - 7 = -3(x - 3)$ or substitute $y = mx + c$ form
- **M1** correct substitution to find c : $7 = -3*3 + c$ so $c = 16$
- **A1** $y = -3x + 16$ cao
- **Answer: $y = -3x + 16$**

Working check: $y - 7 = -3(x - 3) \Rightarrow y - 7 = -3x + 9 \Rightarrow y = -3x + 16$. Check with point (3,7): $7 = -3*3 + 16 = 7$.

Question 7

- **M1** calculate gradient = $(5 - 5)/(5 - 0) = 0/5 = 0$
- **B1** state 'horizontal' oe
- **A1** 0 and horizontal stated cao
- **Answer:Gradient = 0; the line is horizontal.**

Working check: change in $y = 0$ so gradient 0. A horizontal line has gradient 0.

Question 8

- **M1** calculate gradient = $(-4 - 2)/(4 - 1) = -6/3 = -2$
- **M1** substitute a point to find c: $2 = -2 \times 1 + c$ so $c = 4$
- **A1** $y = -2x + 4$ cao
- **B1** final answer clearly shown as gradient -2 and equation $y = -2x + 4$
- **Answer: Gradient = -2; equation $y = -2x + 4$**

Working check: change in $y = -6$, change in $x = 3$ so gradient -2. Using point (1,2): $2 = -2(1) + c \Rightarrow c = 4$.

Question 9

- (a) **M1** gradient = $(3 - 1)/(2 - (-2)) = 2/4 = 1/2$
- (a) **A1** $1/2$ cao
- **(a) Answer: $1/2$**
- (b) **M1** use $y = mx + c$ with $m = 1/2$ and substitute a point, e.g. $1 = (1/2)(-2) + c$
- (b) **A1** y-intercept = 2 cao
- **(b) Answer: y-intercept = 2 (so equation $y = 1/2 x + 2$)**