5.14 Gradient of a Line: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 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 1 is 3 marks)

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2 Find the gradient of the straight line joining the points (2, 3) and (5, 12).

(Total for Question 2 is 1 mark)

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3 The table shows coordinates of points that lie on a straight line.

x	0	1	2	3
y	5	8	11	14

Find the gradient of the line.

(Total for Question 3 is 2 marks)

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4 Write down the gradient of the line with equation $y = 7x + 2$.

(Total for Question 4 is 1 mark)

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

(a) Work out the gradient of the line. **(2)**

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(b) Hence or otherwise find the y-intercept. **(2)**

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(Total for Question 5 is 4 marks)

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6 The points A(1, 0), B(2, -5) and C(5, -20) are plotted. Show whether A, B and C lie on the same straight line.

(Total for Question 6 is 3 marks)

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7 Calculate the gradient of the line joining the points P(-3, 5) and Q(2, -5).

(Total for Question 7 is 2 marks)

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8 A line L1 has gradient 3. Line L2 is parallel to L1 and passes through a different point. State the gradient of L2, giving a reason for your answer.

(Total for Question 8 is 2 marks)

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9 Rearrange $2y = 8x - 6$ into the form $y = mx + c$ and state the gradient.

(Total for Question 9 is 2 marks)

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10 A line L has equation $y = 3x - 4$.

(a) State the gradient of L. **(1)**

(b) Write down the equation of the line M that is parallel to L and passes through the point (1, 2). **(1)**

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(Total for Question 10 is 2 marks)

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11 A narrowboat travels along a canal. After t hours, its distance from the lock, d km, is given by $d = 2.5t + 3$ for $0 \leq t \leq 4$.

(a) State the gradient of this line and explain what it represents in this context. **(2)**

(b) State the value of the d-intercept and explain what it means in this context. **(2)**

(Total for Question 11 is 4 marks)

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Mark scheme · 5.14 Gradient of a Line: 30-minute Pack

Question 1

calculate gradient = (5 - 5)/(5 - 0) = 0/5 = 0	**M1**
state 'horizontal' oe	**B1**
0 and horizontal stated cao	**A1**

Answer:Gradient = 0; the line is horizontal.

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

Question 2

3 cao	**B1**

Answer: 3

Question 3

identifies constant increase of 3 in y for an increase of 1 in x, oe (e.g. uses two points in gradient formula)	**M1**
3 cao	**A1**

Answer: Gradient = 3

Question 4

7 cao	**B1**

Answer: 7

Question 5

(a) gradient = (3 - 1)/(2 - (-2)) = 2/4 = 1/2	**M1**
(a) 1/2 cao	**A1**

(a) Answer: 1/2

(b) use y = mx + c with m = 1/2 and substitute a point, e.g. 1 = (1/2)(-2) + c	**M1**
(b) y-intercept = 2 cao	**A1**

(b) Answer: y-intercept = 2 (so equation y = 1/2 x + 2)

Question 6

gradient of AB found	**M1**
gradient of BC found	**M1**
Yes, both gradients are -5	**A1**

Answer: Yes, both gradients are -5

Question 7

(-5 - 5) / (2 - (-3)) oe	**M1**
-2 cao	**A1**

Answer: Gradient = -2

Question 8

3 cao	**B1**
correct reason given, e.g. parallel lines have the same (equal) gradient	**B1**

Answer: 3, because parallel lines have equal gradients

Question 9

divides every term by 2, oe	**M1**
4 cao (accept full statement y = 4x - 3)	**A1**

Answer: 4

Question 10

(a) 3 cao	**B1**

(a) Answer: 3

(b) y = 3x - 1 cao	**B1**

(b) Answer: y = 3x - 1

Question 11

(a) 2.5 cao	**B1**
(a) correct interpretation, e.g. the speed of the narrowboat is 2.5 km/h	**B1**

(a) Answer: 2.5, the speed of the narrowboat in km/h

(b) 3 cao	**B1**
(b) correct interpretation, e.g. the narrowboat is already 3 km from the lock when t = 0 (the start of the recorded journey)	**B1**

(b) Answer: 3, the narrowboat is 3 km from the lock at t = 0

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