FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

A9: Straight-line graphs

Reason about straight lines, parallel and perpendicular lines

20 marks · 25 minutes · Non-calculator

1) Show that (3, 7) lies on the line $y = 2x + 1$

[Question 1: 1 marks]

2) Explain why the lines $y = 3x + 2$ and $y = 3x - 5$ never meet.

.....

.....

[Question 2: 2 marks]

3) Show that the lines $y = 2x + 1$ and $y = -\frac{1}{2}x + 4$ are perpendicular.

.....

.....

[Question 3: 2 marks]

4) Show that the line through $(1, 3)$ and $(4, 9)$ has equation $y = 2x + 1$

[Question 4: 3 marks]

5) Tom says the gradient of the line through $(2, 5)$ and $(6, 3)$ is 2. Explain his mistake and find the gradient.

.....

.....

[Question 5: 2 marks]

6) Is $2y = 4x + 6$ parallel to $y = 2x - 1$? Explain.

.....

.....

[Question 6: 2 marks]

7) Line L has equation $y = 4 - 3x$. Show that $(2, -2)$ lies on L and that the line perpendicular to L through this point is $y = \frac{1}{3}x - \frac{8}{3}$

[Question 7: 3 marks]

8) A line passes through $(0, -2)$ with gradient 3. Show that it passes through $(4, 10)$

[Question 8: 2 marks]

9) Explain why the line $x = 3$ does not have a gradient that can be written as a number.

.....

[Question 9: 1 marks]

10) Explain how you can tell from $y = mx + c$ whether a line slopes down from left to right.

.....

.....

[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Shown	$2 \times 3 + 1 = 7$ (C1).
2	Explanation	Same gradient 3 so parallel (C1); different intercepts (C1).
3	Shown	$2 \times -\frac{1}{2} = -1$ (M1); C1.
4	Shown	Gradient 2 (M1); $c = 1$ (M1); C1.
5	$-\frac{1}{2}$	He did change in x over change in y / ignored the sign (C1); $-\frac{1}{2}$ (B1).
6	Yes	$y = 2x + 3$ (M1); same gradient (C1).
7	Shown	$4 - 6 = -2$ (B1); gradient $\frac{1}{3}$ (M1); $c = -\frac{8}{3}$ (C1).
8	Shown	$y = 3x - 2$ (M1); $12 - 2 = 10$ (C1).
9	Explanation	It is vertical; change in x is zero (C1).
10	Explanation	If m is negative (C1); y decreases as x increases (C1).