MARKING GUIDELINE

MARKS	DURATION	QUESTIONS
34	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK _____ / 34

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 For $y = 3x + 2$, the gradient is ... (1)

A) 2 **B)** $3x$

C) 3 ✓ **D)** $\frac{2}{3}$

Answer: C — In $y = mx + c$, m is the gradient.

- **A** — that is the y-intercept
- **B** — the gradient is a number, not a term
- **D** — the two values are not divided

1.2 For $y = 4x - 7$, the y-intercept is ... (1)

A) 4 **B)** -7 ✓

C) 7 **D)** $1{,}75$

Answer: B — In $y = mx + c$, c is the y-intercept.

- **A** — that is the gradient
- **C** — the sign matters
- **D** — divided the two values

1.3 The x-intercept of $y = 2x - 6$ is ... (1)

A) 6 **B)** 3 ✓

C) -3 **D)** -6

> **Answer: B** — At the x-intercept $y = 0$, so $2x = 6$.
>
> - **A** — did not divide by 2
> - **C** — got the sign wrong
> - **D** — that is the y-intercept

1.4 A line with a gradient of 0 is ... (1)

A) at $45°$ **B)** vertical

C) horizontal ✓ **D)** impossible

> **Answer: C** — y stays the same for every x.
>
> - **A** — that is a gradient of 1
> - **B** — a vertical line has an UNDEFINED gradient
> - **D** — $y = 5$ is a perfectly good line

1.5 The line through $(0\ ;\ -4)$ and $(2\ ;\ 0)$ has a gradient of ... (1)

A) 2 ✓ **B)** 4

C) -2 **D)** $\frac{1}{2}$

> **Answer: A** — $m = (0 - (-4)) \div (2 - 0) = 2$.
>
> - **B** — used only the change in y
> - **C** — subtracted in the wrong order
> - **D** — divided the wrong way round

1.6 Which line is PARALLEL to $y = 3x + 1$? (1)

A) $y = \frac{1}{3}x$ **B)** $y = -3x + 1$

C) $y = x + 3$ **D)** $y = 3x - 5$ ✓

> **Answer: D** — Parallel lines have the SAME gradient.
>
> - **A** — that is the reciprocal, not the same
> - **B** — that gradient is -3
> - **C** — that gradient is 1

1.7 A line rises from left to right. Its gradient is ... (1)

A) positive ✓ **B)** undefined

C) zero **D)** negative

> **Answer: A** — y increases as x increases.
>
> - **B** — undefined is vertical
> - **C** — zero is horizontal
> - **D** — a negative gradient falls from left to right

1.8 The graph of $y = -2x + 6$ cuts the x-axis at ... (1)

A) $(6\ ;\ 0)$ **B)** $(-3\ ;\ 0)$

C) $(0\ ;\ 6)$ **D) $(3\ ;\ 0)$ ✓**

> **Answer: D** — $0 = -2x + 6$ gives $x = 3$.
> - **A** — did not divide by 2
> - **B** — got the sign wrong
> - **C** — that is the y-intercept

1.9 Which equation has a NEGATIVE gradient and a positive y-intercept? (1)

A) $y = 2x - 3$ **B) $y = -2x + 3$ ✓**

C) $y = 2x + 3$ **D)** $y = -2x - 3$

> **Answer: B** — $m = -2$ and $c = +3$.
> - **A** — that y-intercept is negative
> - **C** — that gradient is positive
> - **D** — both are negative

1.10 The point $(2\ ;\ 7)$ lies on which one of the following lines? (1)

A) $y = x + 7$ **B)** $y = 7x + 2$

C) $y = 3x + 1$ ✓ **D)** $y = 2x + 7$

> **Answer: C** — $3(2) + 1 = 7$.
> - **A** — gives 9
> - **B** — gives 16
> - **D** — gives 11

ANSWER GRID — MARKING GUIDELINE

1.1	A	B	**C**	D
1.2	A	**B**	C	D
1.3	A	**B**	C	D
1.4	A	B	**C**	D
1.5	**A**	B	C	D
1.6	A	B	C	**D**
1.7	**A**	B	C	D
1.8	A	B	C	**D**
1.9	A	**B**	C	D
1.10	A	B	**C**	D

QUESTION 2 [12 MARKS]

Answer the questions below on straight-line graphs of the form $y = mx + c$.

2.1 For $y = 3x + 2$, write down the gradient and the y-intercept, and hence determine the value of y when $x = 4$. (3)

> Gradient $m = \mathbf{3}$ *(1)*
> y-intercept $c = \mathbf{2}$ *(1)*
> $y = 3(4) + 2 = \mathbf{14}$ *(1)*

2.2 Write down the y-intercept of $y = 4x - 7$, and determine its x-intercept. **(3)**

> The y-intercept is $\mathbf{-7}$ *(1)*
> At the x-intercept $y = 0$, so $4x - 7 = 0$ *(1)*
> $x = \frac{7}{4} = \mathbf{1{,}75}$ *(1)*

2.3 Determine the x-intercept of $y = 2x - 6$. **(3)**

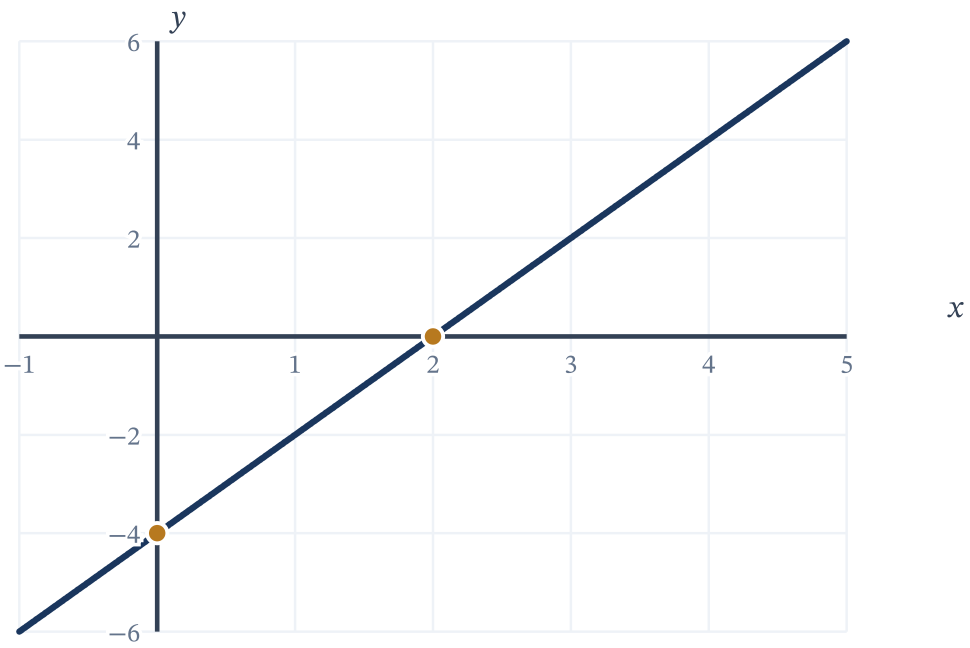
> At the x-intercept $y = 0$ *(1)*
> $2x - 6 = 0$ *(1)*
> $\boldsymbol{x = 3}$ *(1)*

2.4 Describe what the graph of a line with a gradient of 0 looks like, and write down the equation of the horizontal line through $(0\ ;\ 5)$. **(3)**

> It is **horizontal** *(1)*
> y stays the same for every value of x *(1)*
> Its equation is $\boldsymbol{y = 5}$ *(1)*

QUESTION 3 **[12 MARKS]**

The graph of a straight line is drawn below.



3.1 Write down the coordinates of the y-intercept and of the x-intercept, and explain how each one is read from the graph. **(4)**

> y-intercept $\mathbf{(0\ ;\ -4)}$ *(1)* — where the line crosses the y-axis, so $x = 0$ *(1)*
> x-intercept $\mathbf{(2\ ;\ 0)}$ *(1)* — where it crosses the x-axis, so $y = 0$ *(1)*

3.2 Determine the gradient of the line. **(3)**

> $m = \frac{\text{change in } y}{\text{change in } x} = \frac{0 - (-4)}{2 - 0}$ *(2)*
> $= \mathbf{2}$ *(1)*

3.3 Hence determine the equation of the line in the form $y = mx + c$. **(3)**

> $m = 2$ and $c = -4$ *(2)*
> $\boldsymbol{y = 2x - 4}$ *(1)*

3.4 State whether the gradient is positive or negative, and explain how the graph shows this. **(2)**

> **Positive** *(1)* — the line rises from left to right *(1)*

TOTAL: 34 marks

This question paper consists of 3 questions.

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