PEARSON EDEXCEL INTERNATIONAL GCSE MATHEMATICS A (4MA1) · HIGHER TIER

Straight Line Graphs: exam questions

10 questions · 26 marks · mark schemes at the end

Name _____ Date _____ Score / 26

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/straight-line-graphs

1. **2 marks**

A line has equation $3y = 6x - 9$.

Write down the gradient of the line and the coordinates of the point where it crosses the y-axis.

2. **3 marks**

Find an equation of the straight line through the points $(1, 4)$ and $(3, 10)$.

3. **2 marks**

Find an equation of the line that is parallel to $y = 4x - 1$ and passes through $(2, 3)$.

4. 3 marks

Find an equation of the line that is perpendicular to $y = 2x + 5$ and passes through $(4, 1)$.

5. 2 marks

A is the point $(-2, 5)$ and B is the point $(6, -1)$.

Find the coordinates of the midpoint of AB.

6. 2 marks

P is the point $(1, 2)$ and Q is the point $(7, 10)$.

Work out the length of PQ.

7. 3 marks

The line L has equation $2x + 3y = 12$. L crosses the x-axis at A and the y-axis at B. O is the origin.

Work out the area of triangle AOB.

8. **4 marks**

A is the point $(2, 1)$ and B is the point $(6, 9)$.

Find an equation of the perpendicular bisector of AB.

9. **3 marks**

The line L has equation $y = 3x - 2$.

(a) Show that the point $(5, 13)$ lies on L. **(1)**

(b) Find the x-coordinate of the point where L meets the line $y = 6 - x$. **(2)**

10. **2 marks**

Line A has equation $y = 3x + 2$. Line B has equation $x + 3y = 9$.

Show that lines A and B are perpendicular.

Answers and worked solutions

Question 1 — 2 marks

B1 gradient 2

B1 $(0, -3)$

Answer: gradient 2, $(0, -3)$

Question 2 — 3 marks

M1 gradient $\dfrac{10-4}{3-1} = 3$

M1 $4 = 3 \times 1 + c$

A1 $y = 3x + 1$

Answer: $y = 3x + 1$

Question 3 — 2 marks

M1 $y = 4x + c$ with $3 = 8 + c$

A1 $y = 4x - 5$

Answer: $y = 4x - 5$

Question 4 — 3 marks

M1 gradient $-\frac{1}{2}$

M1 $1 = -\frac{1}{2} \times 4 + c$

A1 $y = -\frac{1}{2}x + 3$

Answer: $y = -\frac{1}{2}x + 3$

Question 5 — 2 marks

M1 $\left(\dfrac{-2+6}{2}, \dfrac{5+(-1)}{2}\right)$

A1 $(2, 2)$

Answer: $(2, 2)$

Question 6 — 2 marks

M1 $\sqrt{6^2 + 8^2}$

A1 10

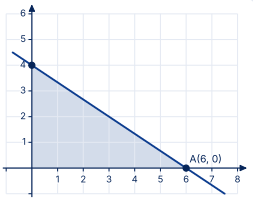
Answer: 10

Question 7 — 3 marks

B1 $A = (6, 0)$

B1 $B = (0, 4)$

B1 $\frac{1}{2} \times 6 \times 4 = 12$



Answer: 12 square units

Question 8 — 4 marks

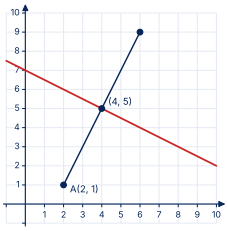
M1 midpoint $(4, 5)$

M1 gradient of AB is 2

M1 perpendicular gradient $-\frac{1}{2}$, $5 = -\frac{1}{2} \times 4 + c$

A1 $y = -\frac{1}{2}x + 7$

Answer: $y = -\frac{1}{2}x + 7$



Question 9 — 3 marks

(a)

B1 $3 \times 5 - 2 = 13$

(b)

M1 $3x - 2 = 6 - x$

A1 $x = 2$

Answer: (a) shown; (b) 2

Question 10 — 2 marks

M1 $y = -\frac{1}{3}x + 3$, so the gradient of B is $-\frac{1}{3}$

A1 $3 \times -\frac{1}{3} = -1$, so the lines are perpendicular

Answer: shown

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/straight-line-graphs
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