GCSE MATHEMATICS
AQA | Edexcel | OCR | WJEC
(Level 4 - 7)

Parallel and Perpendicular Lines

Please write clearly in block capitals

Forename:	
Surname:	

Materials

For this paper you must have:
*   mathematical instruments

You must *not* use a calculator.

Instructions

*   Use black ink or black ball-point pen. Draw diagrams in pencil.
*   Fill in the boxes at the top of this page.
*   Answer all questions.
*   You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
*   Do all rough work in this book. Cross through any work you do not want to be marked.

Information

*   The marks for questions are shown in brackets.
*   You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

*   In all calculations, show clearly how you work out your answer.

1   Define the following terms in relation to straight lines and equations of straight lines: *(Level 4)*

1(a)   'Parallel'

[1 mark]

_____

_____

1(b)   'Perpendicular'

[1 mark]

_____

_____

2(a)   Circle the line below which is parallel to $y = 5x + 4$ *(Level 4)*

[1 mark]

$y + 5x = 3$ $y - 5x = 2$

$2y = 5x + 10$ $y = 6x + 3$

2(b)   Circle the line below which is parallel to $y = 3x + 4$

[1 mark]

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

$2y = 6x + 10$ $y = 6x + 4$

Turn over for next question

4

Turn over ►

3(a) Find the equation of a line which passes through point $(-1, 5)$ and is parallel to $3x + y = -12$ *(Level 4)*

Circle your answer.

[1 mark]

$3y = -3x + 6$ $3y = -3x + 7$

$y = -3x + 2$ $y = -3x + 7$

3(b) Find the equation of a line which passes through point $(2, 5)$ and is parallel to $y = 4x - 10$

Circle your answer.

[1 mark]

$2y = -3x + 2$ $y = 4x - 3$

$2 = -3x + 2y$ $2y = -x + 12$

3(c) Find the equation of a line which passes through point $(4, 1)$ and is parallel to $y = 2x - 2$

Circle your answer.

[1 mark]

$4y = x - 7$ $y = -2x - 1$

$1 = y - 2x - 7$ $y = 2x - 7$

Turn over for next question

3

Turn over ►

4 Determine if each of the following lines are parallel to line $y = 5x + 2$ or not. *(Level 4)*

4(a) $$y = -5x + 4$$

[1 mark]

Answer _____

4(b) $$5y = -x + 2.$$

[1 mark]

Answer _____

4(c) $$y = 5x + 10$$

[1 mark]

Answer _____

4(d) $$y - 5x = 0$$

[1 mark]

Answer _____

4(e) $$y = \frac{1}{5}x + 4$$

[1 mark]

Answer _____

Turn over for next question

5

Turn over ▶

5(a) The line CD is defined by the points $C(-2,1)$ and $D(10,7)$.   *(Level 5)*

Find the equation of the line CD.

[2 marks]

Answer _____

For each of the following lines, label them as parallel to CD, perpendicular to CD, or neither.

5(b)
$$y = -2x$$

[1 mark]

Answer _____

5(c)
$$y = \frac{1}{2}x$$

[1 mark]

Answer _____

5(d)
$$12y = 6x + 7$$

[1 mark]

Answer _____

Question continues on next page

5

5(e)
$$2y = 2x + 2$$

[1 mark]

_____

_____

Answer _____

5(f)
$$2(y - 3x) = 5 - 2x$$

[1 mark]

_____

_____

Answer _____

5(g)
$$0 = \frac{2x + y}{2}$$

[1 mark]

_____

_____

Answer _____

3

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6   Line D is parallel to the line C.   *(Level 5)*

Two points on C are (2,-2) and (11,4).

(3,2) is a point on D.

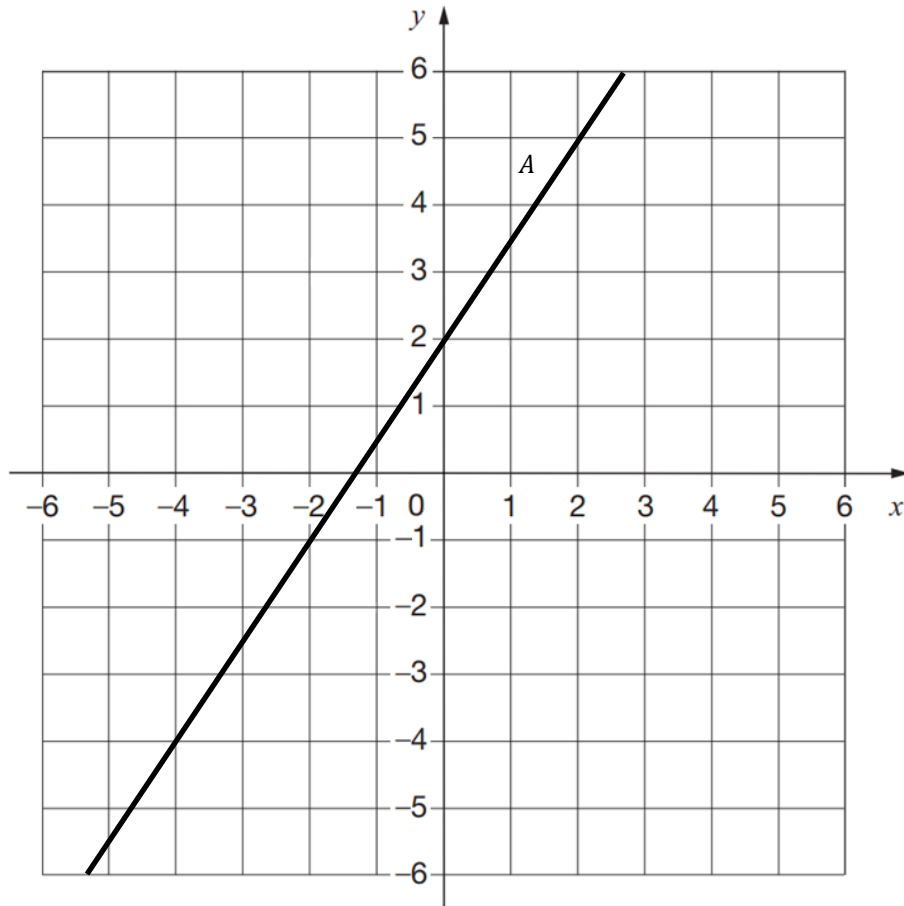Find another point on D.

[3 marks]

_____

_____

_____

_____

_____

_____

Answer   _____

3

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7   Line A is shown below.   *(Level 5)*

7(a)   Give the equation of a line which is parallel to line A

[2 marks]

Answer

7(b)   Give the equation of a line which is perpendicular to line A

[2 marks]

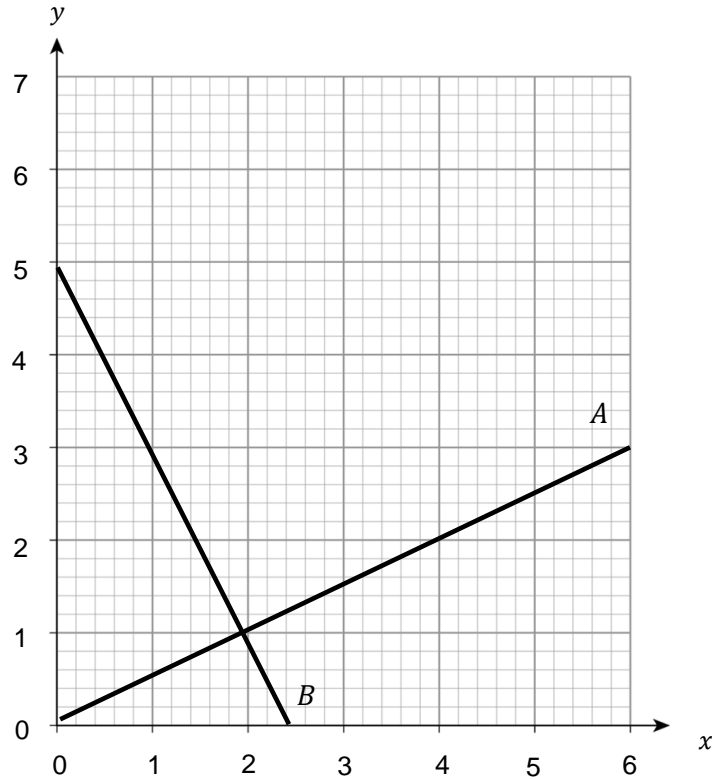Answer

4

Turn over ▶

8 A and B are two perpendicular lines with equations: *(Level 6)*

$$A: y = mx$$

$$B: y = px + 5$$

8(a) Find the equation for line A

[2 marks]

_____

_____

Answer _____

8(b) Find the equation for line B

[2 marks]

_____

_____

Answer _____

4

Turn over ►

9(a) Find the equation of the line that passes through (9,14) and is parallel to $y = \frac{1}{3}x - 5$

(Level 6)

[2 marks]

Answer _____

9(b) Find the equation of the line that passes through (5,4) and is perpendicular to $y = -3x + 4$

[2 marks]

Answer _____

9(c) Find the equation of the line that passes through (-1,-5) and is perpendicular to $y = \frac{1}{3}x - 2$

[2 marks]

Answer _____

9(d) Find the equation of the line that is parallel to $2y = 3(2 - 3x)$ and passes through the point of intersection of $y = x + 8$ and $y = -3x + 4$

[3 marks]

Answer _____

Turn over for next question

9

Turn over ▶

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10   One side of a rectangle lies on the line $y = \frac{2}{3}x + 3$ *(Level 7)*

Write down three other equations that could form the other three sides of the
rectangle.

[3 marks]

_____

_____

_____

_____

_____

_____

Answer   _____

11(a)   The line A is given as $5y - 2x - 2 = 0$.   *(Level 7)*

The line B is perpendicular to A and passes through the point (1,-1)

Find the point of intersection of the two lines.

[2 marks]

_____

_____

Answer   _____

11(b)   A third line, C, is perpendicular to B and has y-intercept of -3. Write down the
equation of C.

[1 mark]

_____

_____

Answer   _____

End of questions

6