

Parallel and Perpendicular Lines

Please write clearly in block capitals

Forename:

Surname:

Materials

For this paper you must have:

- mathematical instruments



You *can* 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:

1(a) 'Parallel'

[1 mark]

1(b) 'Perpendicular'

[1 mark]

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

[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]

$$y + 3x = 3$$

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

$$2y = 6x + 10$$

$$y = 6x + 4$$

Turn over for next question

3(a)

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

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

Turn over ►

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

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

Turn over ►

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



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Turn over ►

- 6 Line D is parallel to the line C .
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 _____



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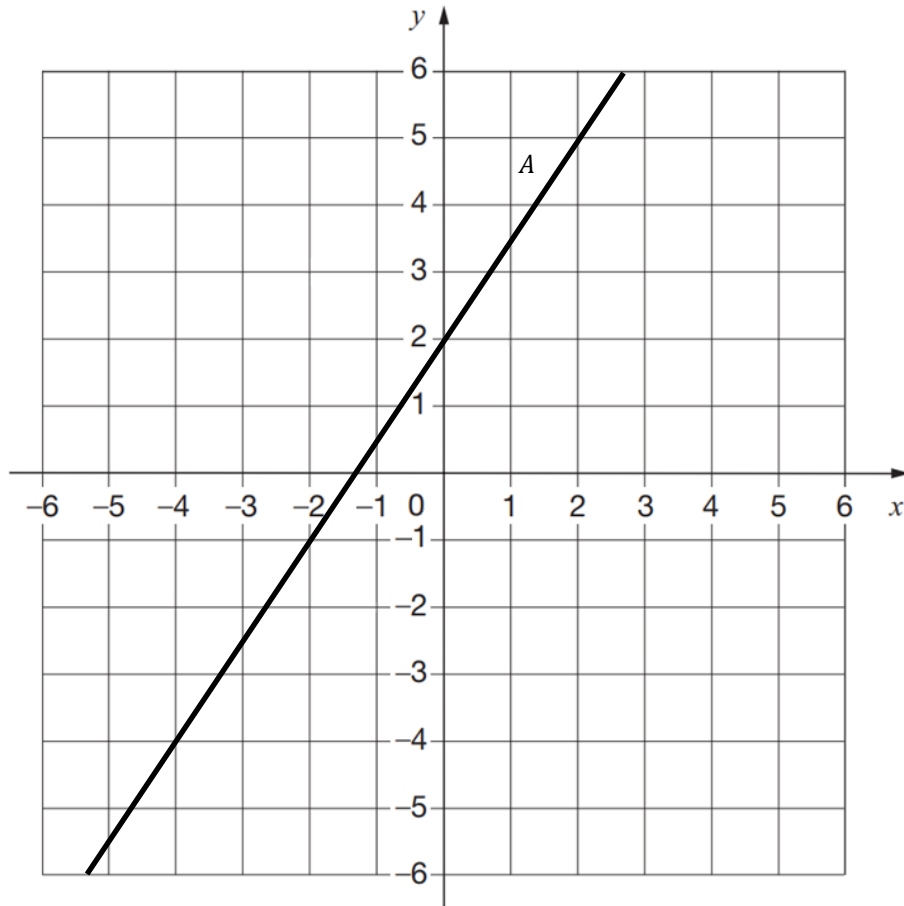
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Turn over ►

7 Line A is shown below.



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

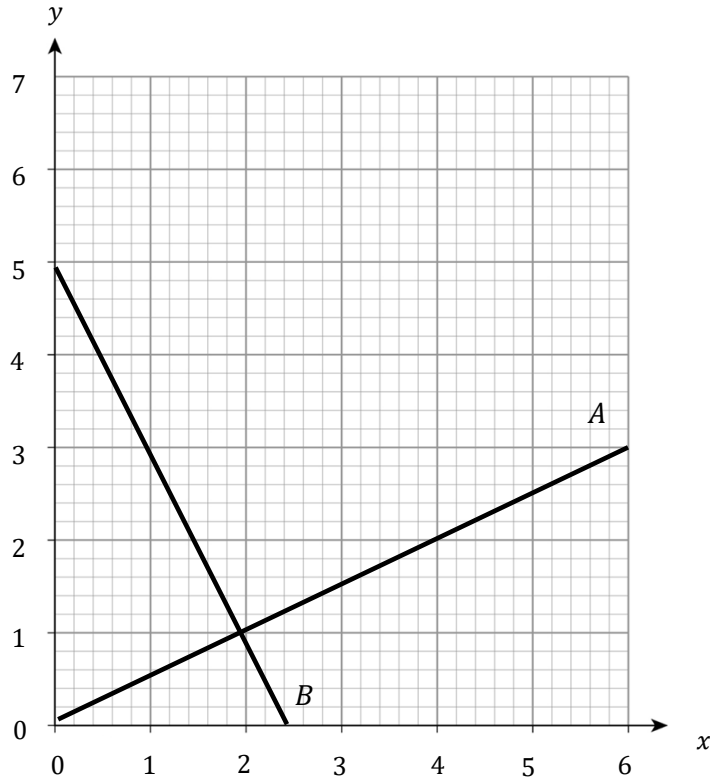
[2 marks]

Answer _____

8 A and B are two perpendicular lines with equations:

$$A: y = mx$$

$$B: y = px + 5$$



8(a) Find the equation for line A

[2 marks]

Answer _____

8(b) Find the equation for line B

[2 marks]

Answer _____

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

[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

- 10** One side of a rectangle lies on the line $y = \frac{2}{3}x + 3$
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 $5y - 2x - 2 = 0$.
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