

Coordinates and Ratios

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.

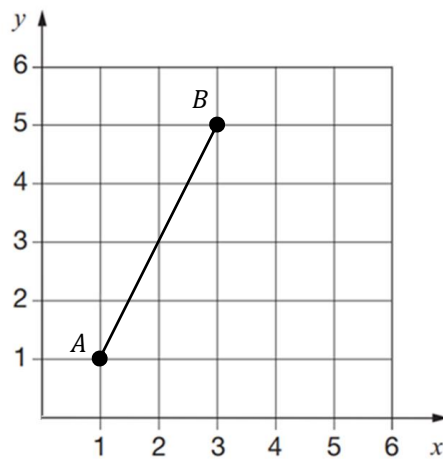
Advice

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

1 Midpoints are points that are found exactly half way along a line. (Level 3)

1(a) Find the coordinates of the midpoint for the line AB , shown below.

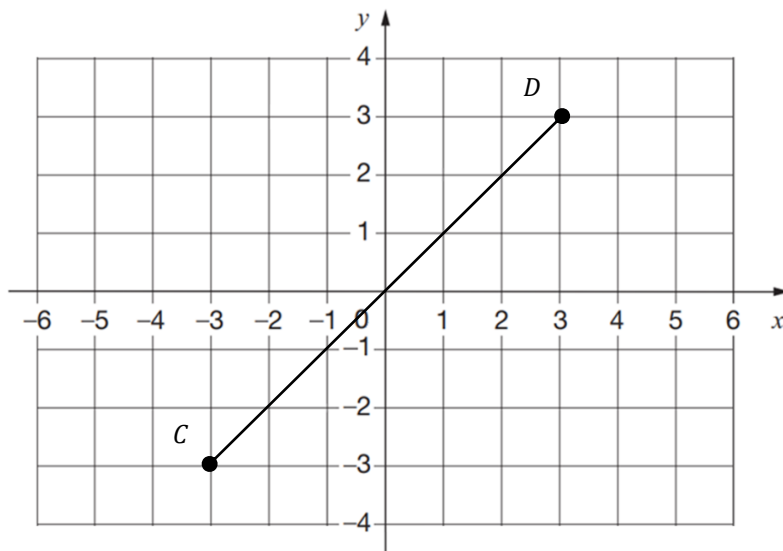
[1 mark]



Answer _____

1(b) Find the coordinates of the midpoint for the line CD , shown below.

[1 mark]

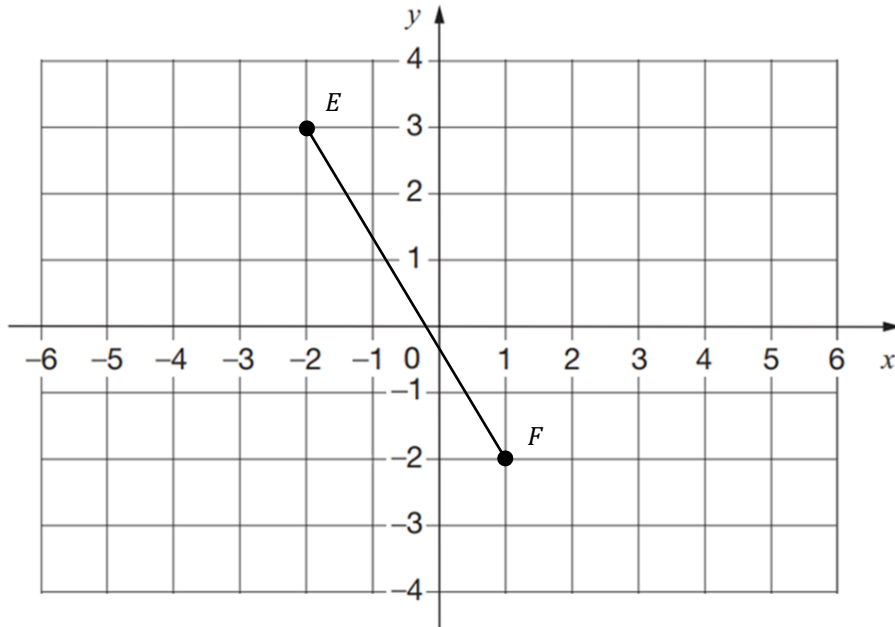


Answer _____

Question continues on next page

1(c) Find the coordinates of the midpoint of the line EF , shown below.

[1 mark]



Answer _____



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2(a) The points A and B form a line segment AB . M is the midpoint of AB . (Level 4)

$$A = (5, 10)$$

$$B = (17, 8)$$

Find the coordinates of M .

[1 mark]

Answer _____

2(b) The points C and D form a line segment CD . M is the midpoint of CD .

$$C = (-2, -10)$$

$$D = (-7, -14)$$

Find the coordinates of M .

[1 mark]

Answer _____

2(c) The points E and F form a line segment EF . M is the midpoint of EF .

$$E = (0, -10)$$

$$F = (-6, 0)$$

Find the coordinates of M .

[1 mark]

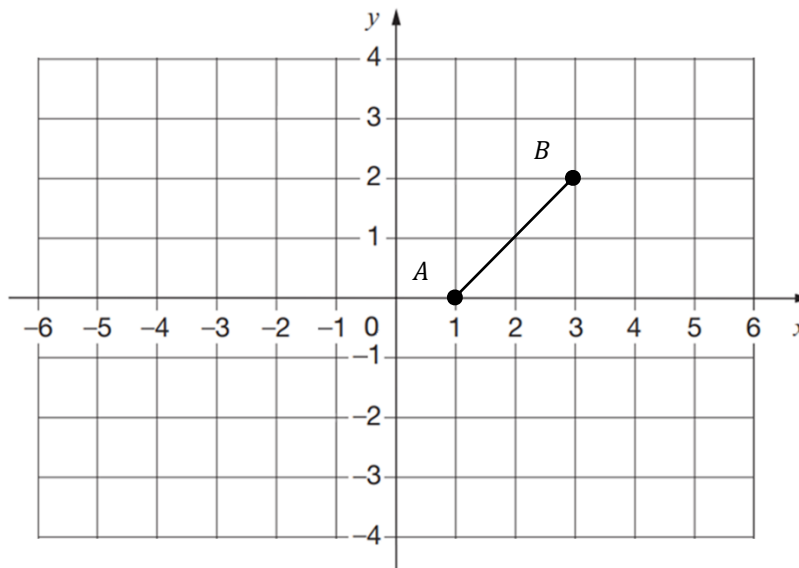
Answer _____

Turn over for next question

3

A and B are two points of a square $ABCD$.

(Level 4)



Write down two sets of possible coordinates for C and D .

[2 marks]

$C =$ _____ and $D =$ _____

$C =$ _____ and $D =$ _____

Turn over for next question

4

4(a) Point D lies on a line AB such that AD is $\frac{2}{3}$ of the total length of AB . (Level 5)

Given that $A(2, 4)$ and $B(17, 13)$, find the point D .

[3 marks]

$D =$ _____

4(b) E lies on the line AB such that AE is $\frac{5}{7}$ of the total length of AB .

Given that $A(0, 10)$ and $B(-21, -25)$, find the point E .

[3 marks]

$E =$ _____



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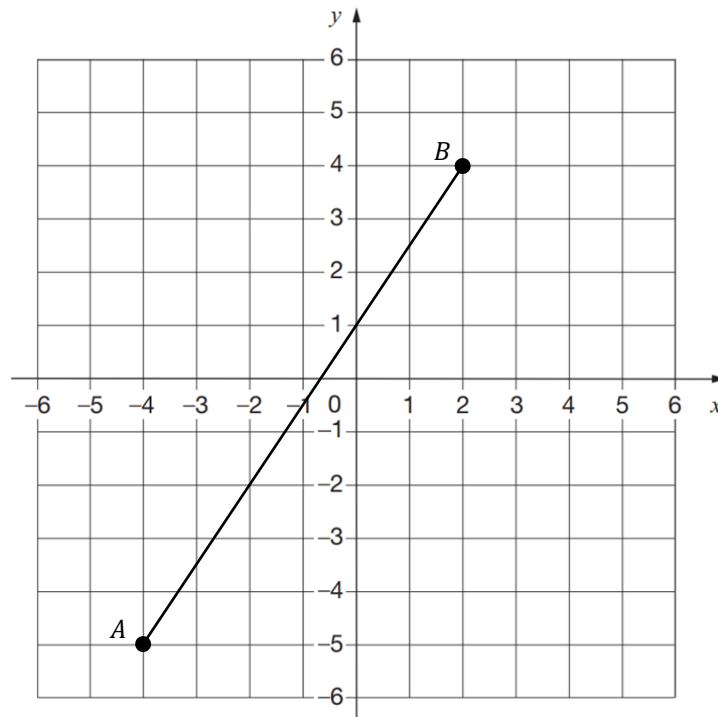
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5

Point C lies on the line segment AB

(Level 6)

C is such that the ratio $AC:CB = 1:2$ 

5(a) What are the coordinates of the point C?

[2 marks]

$C =$ _____

5(b) Another point X lies on the line segment AB.

This divides the line segment in the ratio $AC:CX:XB = 2:1:3$

What are the coordinates of the point X?

[2 marks]

$X =$ _____

6 F lies on a line AB such that AF is $\frac{3}{4}$ of the length of AB . (Level 6)

6(a) Given that $A(0,0)$ and $B(20,-8)$, find the point F .

[2 marks]

$F =$ _____

6(b) G lies on AF such that $AG:GF = 1:2$.

Write down the ratio $AG:GF:FB$.

[1 mark]

Answer: _____

6(c) Hence find the co-ordinate G .

[2 marks]

$G =$ _____



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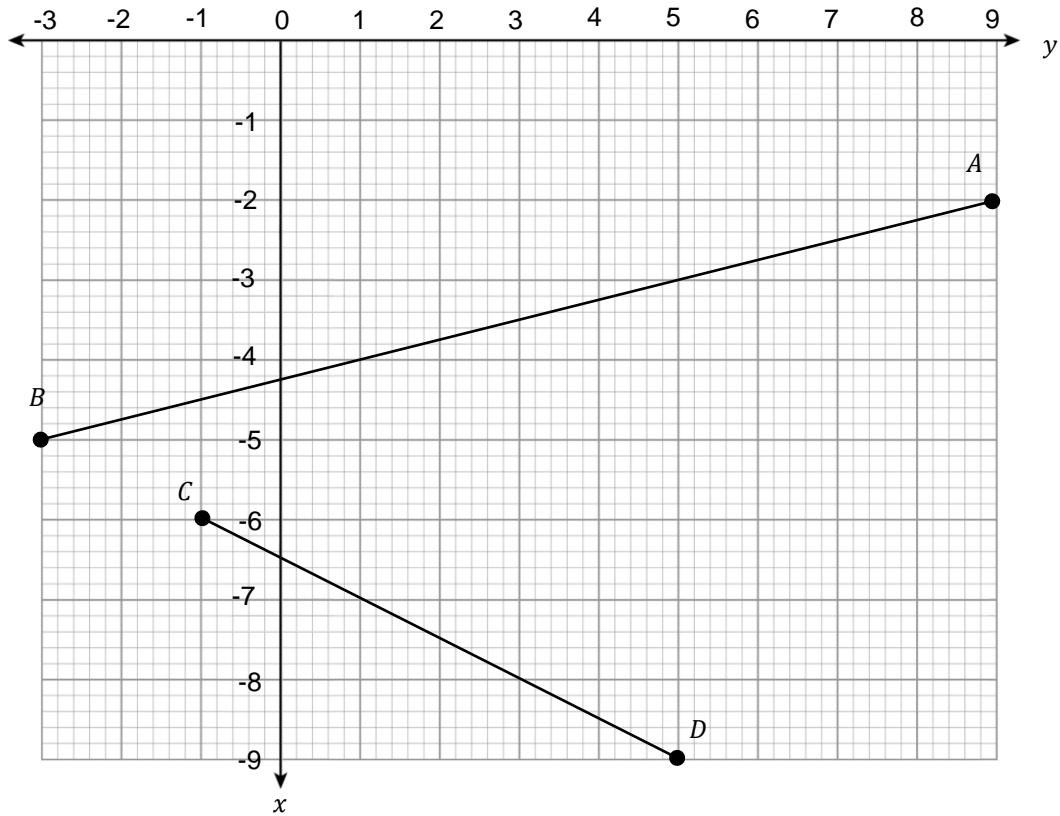
7

X is a point on the line segment AB .

(Level 6)

Y is a point on the line segment CD .

$$AX:XB = CY:YD = 1:2$$



Find the equation of the line XY and plot this on the graph above, making sure to label any points of interest.

[4 marks]

Answer _____

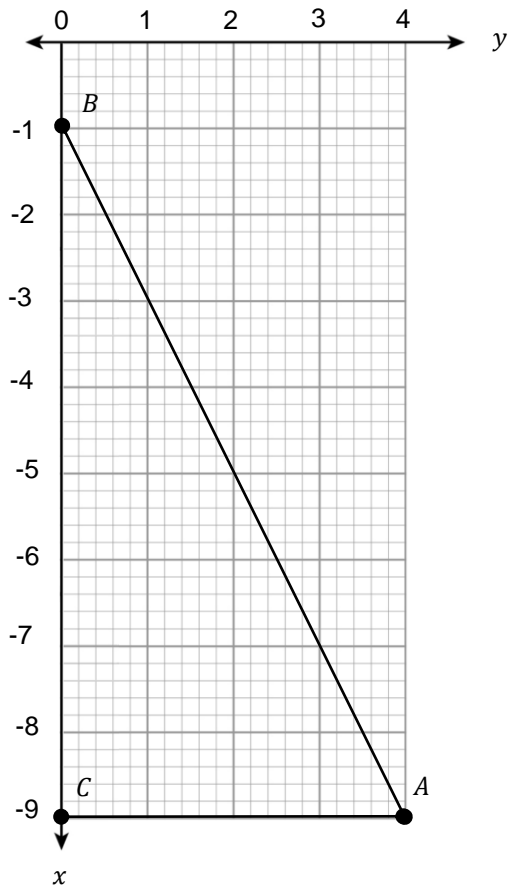
Turn over for next question

Turn over ►

8

The midpoints of the lines AB , BC and AC are X , Y and Z respectively.

(Level 6)

By first finding the points X, Y and Z , draw the shape XYZ on the diagram above.**[3 marks]**

End of Questions