

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Solving shape problems involving coordinates

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

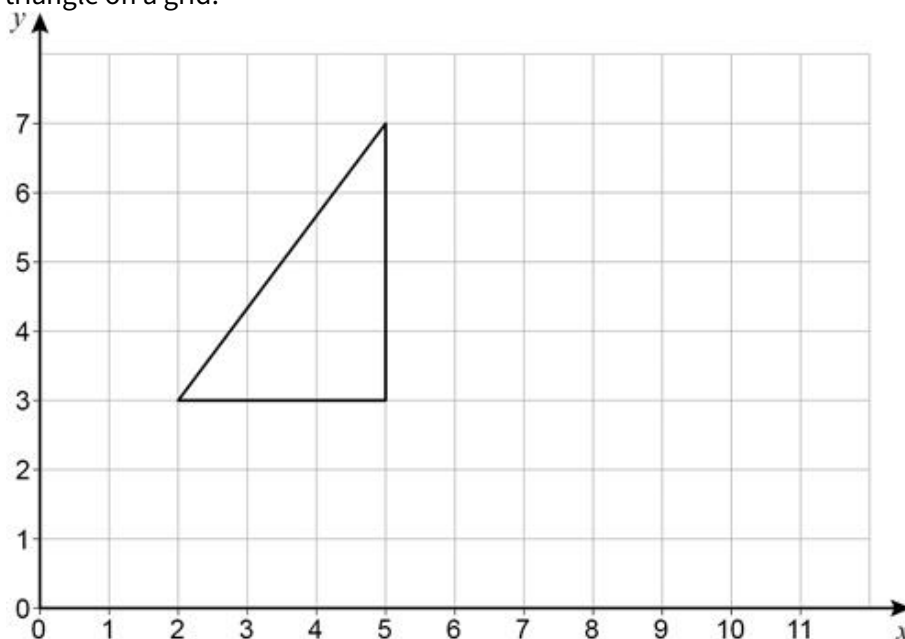
- In all calculations, show clearly how you work out your answer

For questions 1 to 4 you must **NOT** use a calculator.



Q1.

Here is a triangle on a grid.



The triangle is reflected in a vertical line.

Two of the vertices of the reflected triangle are at (7, 3) and (7, 7)

(a) What are the coordinates of the other vertex of the reflected triangle?

(1)

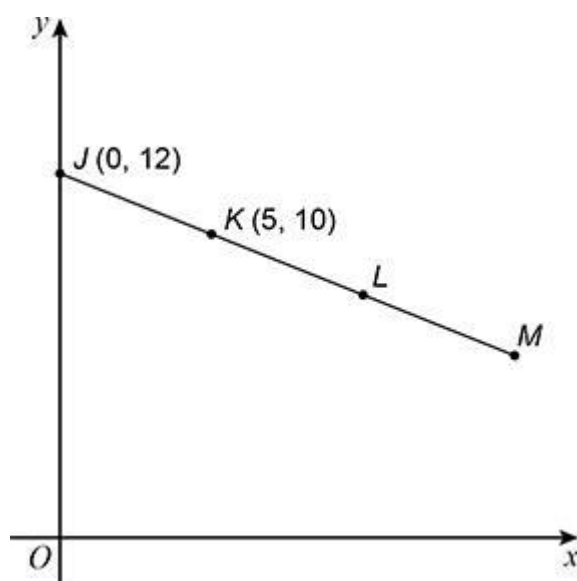
(b) What is the equation of the line of reflection?

(1)

(Total 2 marks)

Q2.

$J(0, 12)$ and $K(5, 10)$ are points on the straight line $JKLM$.



Not drawn
accurately

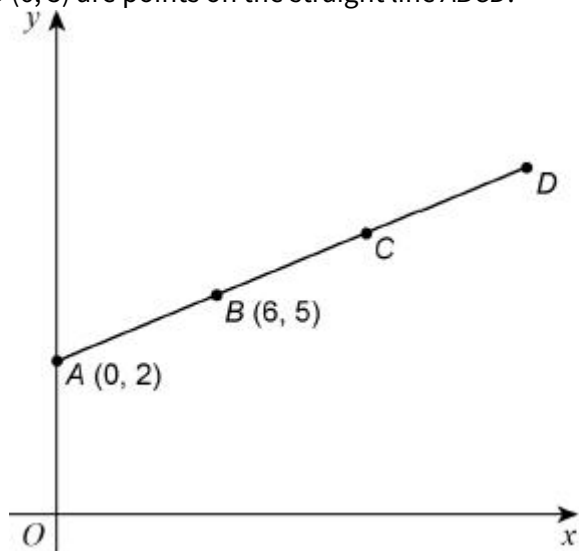
$JK = KL = LM$

Work out the coordinates of M .

(Total 3 marks)

Q3.

$A(0, 2)$ and $B(6, 5)$ are points on the straight line $ABCD$.



Not drawn
accurately

$$AB = BC = CD$$

Work out the coordinates of D .

(Total 3 marks)

Question 4 is **higher** tier only

Q4.

A is the point $(2, -5)$

B is the point $(4, -9)$

- (a) Show that the gradient of the straight line passing through A and B is -2

(2)

- (b) C is the point $(-301, 601)$

Does C lie on the straight line passing through A and B ?

You **must** show your working.

(2)

(Total 4 marks)

For the rest of the questions, you **may** use a calculator.



Q5.

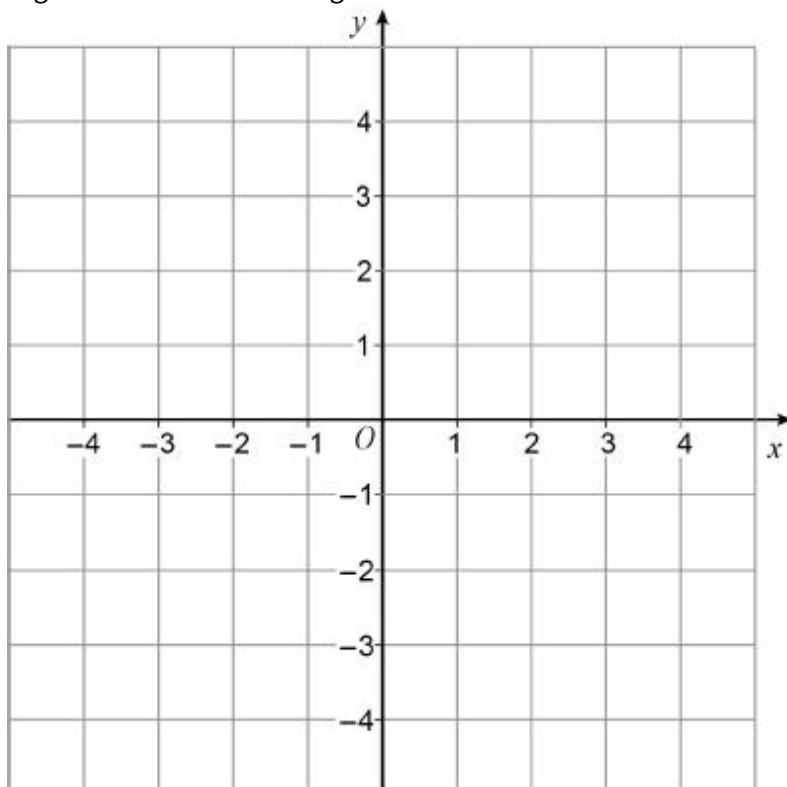
ABC is a right-angled triangle.

A is the point $(-3, -2)$

B is the point $(1, -2)$

C is a point on the line $y = 4$

- (a) Draw triangle ABC on a centimetre grid like the one below.



- (b) Work out the area of triangle ABC .

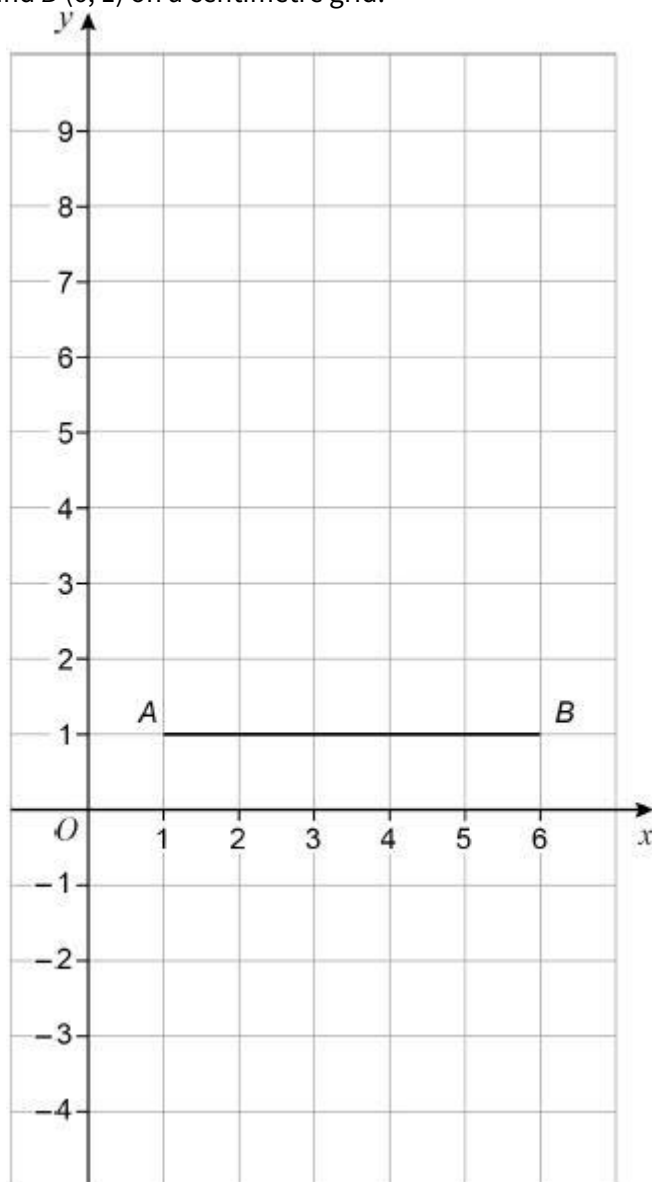
(3)

(2)

(Total 5 marks)

Q6.

A line joins $A(1, 1)$ and $B(6, 1)$ on a centimetre grid.



P is a point on the line AB such that

$$AP : PB = 2 : 3$$

C is a point such that

angle APC is 90°

and

$$PC = 4 \text{ cm}$$

Write down the coordinates of the **two** possible points for C .

(Total 3 marks)

Q7.

P and Q are points.

The x -coordinate of Q is 4 **more** than the x -coordinate of P .

The y -coordinate of Q is 5 **less** than the y -coordinate of P .

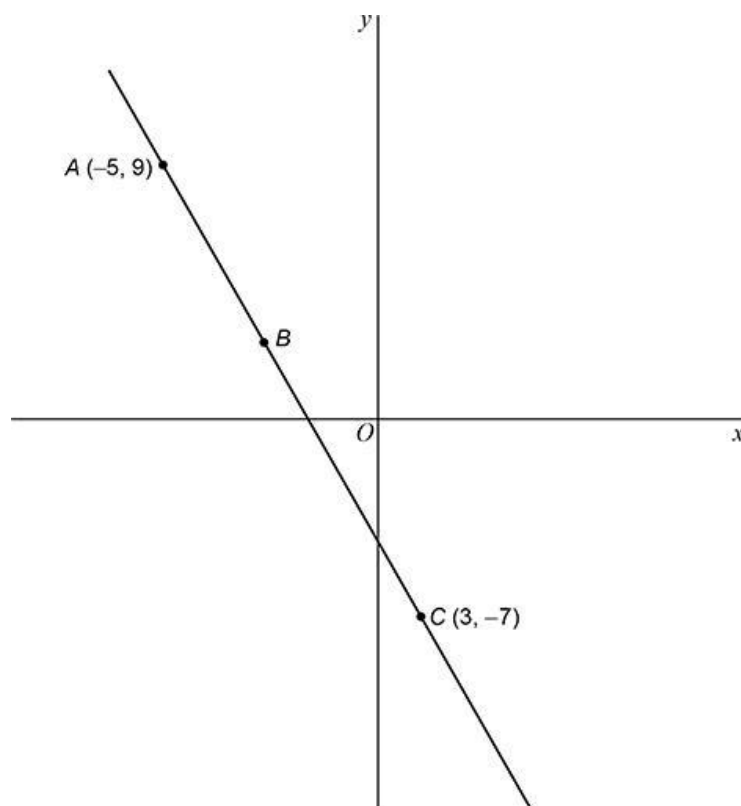
Work out the gradient of the straight line through P and Q .

(Total 2 marks)

Questions 8 and 9 are **higher** tier only

Q8.

A straight line passes through points $A(-5, 9)$, B and $C(3, -7)$.



Not drawn
accurately

- (a) $AB : BC = 1 : 3$

Work out the coordinates of point B .

(3)

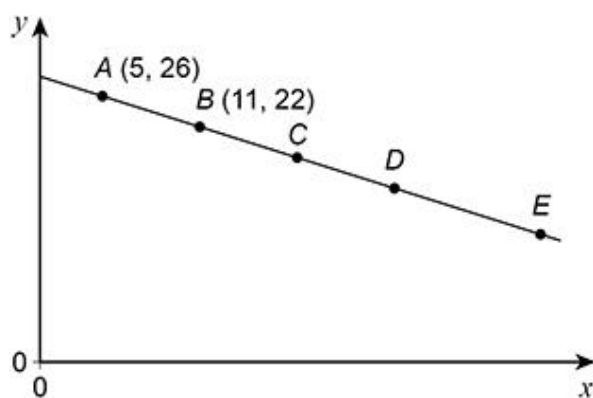
- (b) Work out the equation of the line perpendicular to AC that passes through C .

(4)

(Total 7 marks)

Q9.

A, B, C, D and E are points on a straight line.



Not drawn
accurately

A, B, C and D are equally spaced.

$AD : DE = 2 : 1$

Work out the coordinates of E .

(Total 3 marks)