Name:.....

Total Marks:.....

GCSE (9-1) Grade 8/9 Equations of Perpendicular lines

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions.

Answer the questions in the spaces provided
  - there may be more space than you need.
- **Show all your working out**

Information

- The total mark for this paper is 75.
- The marks for **each** question are shown in brackets.
  - use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

Advice

- Read each question carefully before you start to answer it
- Attempt every question
- Check your answers if you have time at the end

1. Here are the equations of 5 straight lines:

A: $y = 3x + 2$

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

C: $y = -\frac{1}{3}x + 4$

D: $3y - 6 - x = 0$

E : $3x - y - 2 = 0$

F: $x + 3y - 6 = 0$

(a) Write down the letter of the line that is parallel to $y = 3x - 5$

.....

(2)

(b) Write down the letter of the line that is perpendicular to $y = 3x - 2$

.....

(2)

(c) Write down the letter of the line that is perpendicular to $y = -3x + 5$

.....

(2)

2. The straight line *L* has equation $y = 6x - 9$

Find an equation of the straight line perpendicular to *L* which passes through (0, 1).

(Total 3 marks)

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3. Find the equation of the line that passes through the point (-2, 5) and is perpendicular to the line $y = 3x + 6$

(Total 3 marks)

4. Find an equation of the line that passes through the point (3, 4) and is perpendicular to the line $4x - 6y + 7 = 0$

(Total 3 marks)

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5. Find an equation of the line that passes through the point (5, -5) and is perpendicular to the line $y = \frac{2}{3}x + 5$. Write your answer in the form $ax + by + c = 0$, where a, b and c are integers

(Total 4 marks)

6. *A* is the point with coordinates (1, 3)
B is the point with coordinates (4, −1)
The straight line *L* goes through both *A* and *B*.

Is the line with equation $2y = 3x - 4$ perpendicular to line *L*?
You must show how you got your answer.

(Total 4 marks)

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7. The line l passes through the points (-3, 0) and (3, -2) and the line n passes through the points (1, 8) and (-1, 2).
Show that the line l and n are perpendicular

(Total 4 marks)

8. $A(-2,\ 1), B(6,\ 5)$, and $C(4,\ k)$ are the vertices of a right-angled triangle *ABC*. Angle *ABC* is the right angle.

Find an equation of the line that passes through *A* and *C*.
Give your answer in the form $ay + bx = c$ where *a, b* and *c* are integers.

(Total 5 marks)

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9. The vertices of a quadrilateral ABCD have coordinates A(-1, 5), B(7, 1), C(5, -3) and D(-3, 1).
Show that the quadrilateral is a rectangle

(Total 5 marks)

10. The line m has equation $x - 2y - 4p = 0$

The line n has equation $px - y + 9 = 0$

p is a constant.

Given that lines m and n are perpendicular, find the coordinates of the point where they intersect

(Total 5 marks)

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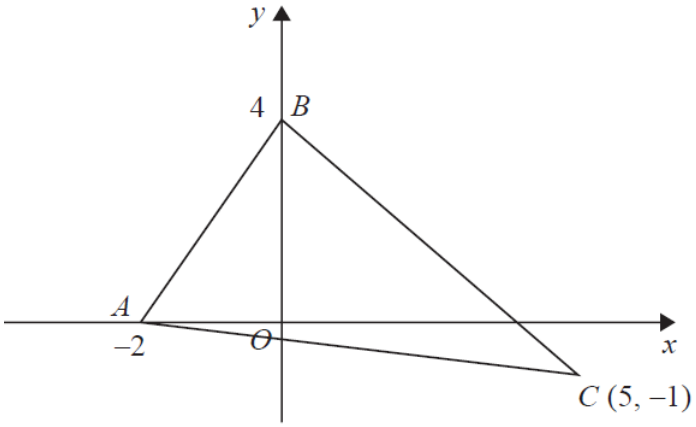
11. Show that line $5x - y + 2 = 0$ is perpendicular to line $2x + 10y - 4 = 0$

(Total 4 marks)

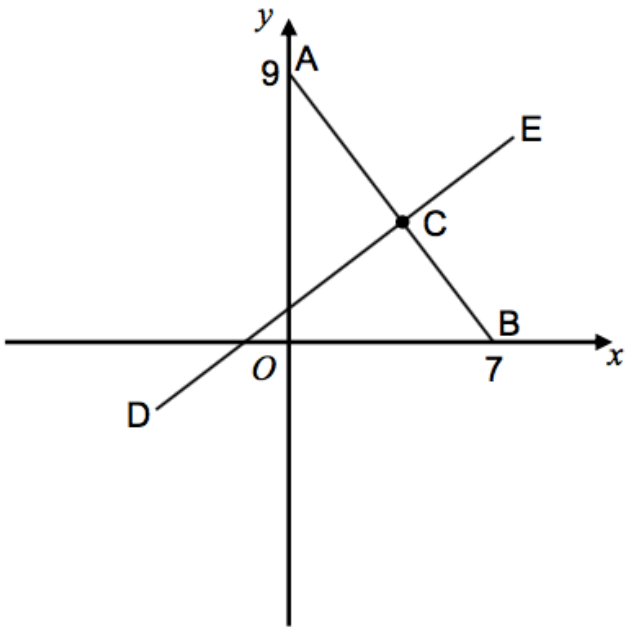
12.



Find an equation of the line that passes through *C* and is perpendicular to *AB*.

(Total 4 marks)

13.

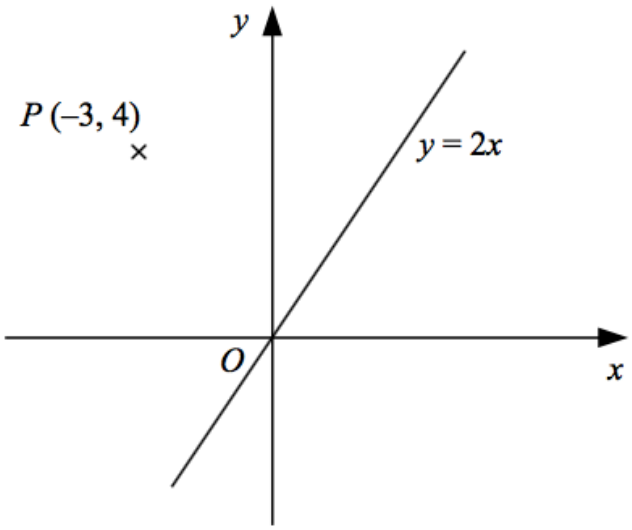


Not Drawn Accurately

C is the midpoint of AB.
DCE is perpendicular to ACB.
Work out the equation of the line DCE.

(Total 5 marks)

14.

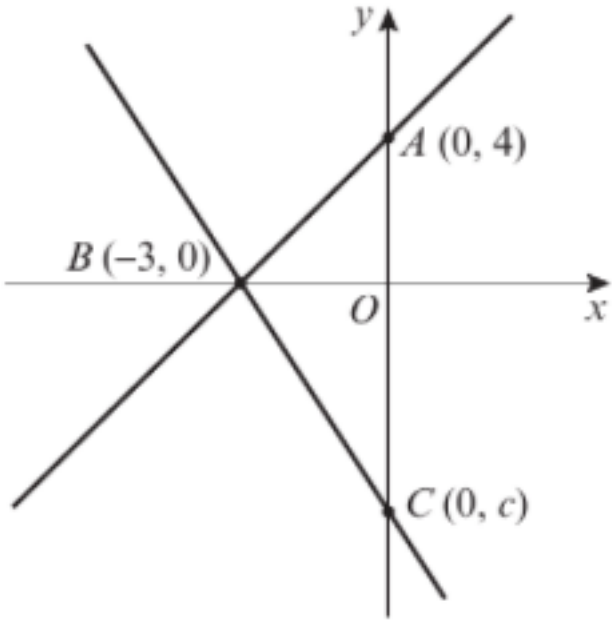


The diagram shows the point *P* with coordinates (-3, 4) and the line with equation $y = 2x$

The point *Q* is such that the line $y = 2x$ is the perpendicular bisector of *PQ*
Find the coordinates of *Q*

(Total 5 marks)

15. The points *A* and *C* lie on the y-axis and the point *B* lies on the x -axis as shown in the diagram



The line through points *A* and *B* is perpendicular to the line through points *B* and *C*. Find the value of c

(Total 5 marks)

15.

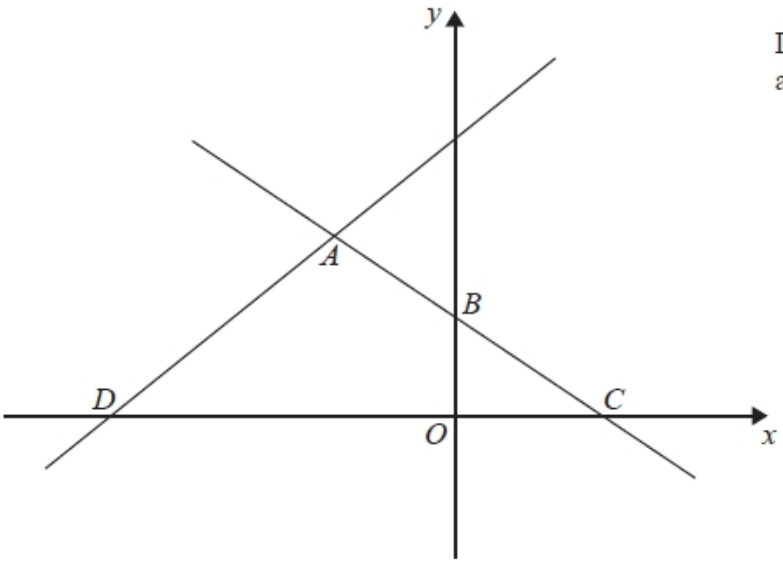


Diagram **NOT** accurately drawn

In the diagram, *ABC* is the line with equation $y = \frac{1}{2}x + 5$

AB = *BC*

D is the point with coordinates (−13, 0)

Find an equation of the line through *A* and *D*.

(Total 5 marks)

16. *P* has coordinates (–9, 7)
Q has coordinates (11, 12)

M is the point on the line segment *PQ* such that *PM* : *MQ* = 2 : 3

Line **L** is perpendicular to the line segment *PQ*.
L passes through *M*.

Find an equation of **L**.

(Total 5 marks)

TOTAL FOR PAPER: 75 MARKS