

TOTAL MARKS: /40

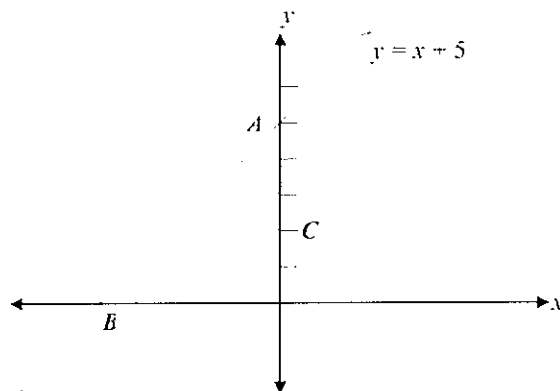
NAME: \_\_\_\_\_

**YEAR 10 ADVANCED MATHEMATICS**  
**CO-ORDINATE GEOMETRY**

*Instructions:*

- Attempt all questions.
- Show all necessary working.

1. [6]



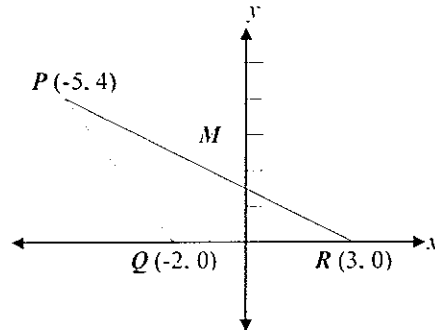
$AB$  is the line with equation  $y = x + 5$   
 $C$  has co-ordinates  $(0,2)$

(a) What are the co-ordinates of  $B$ ?

(b) What is the gradient of  $AB$ ?

(c) What is the equation of the line through  $C$ , parallel to  $AB$ ?

2. [13]



(a) Calculate the distance  $PQ$ .

(b) Find the co-ordinates of  $M$ , the mid-point of  $PR$ .

(c) Calculate the gradient of  $PR$ .

(d) Is  $MQ$  perpendicular to  $PR$ ? Give reasons for your answer.

(e) Find the equation of the line  $PR$ . Equation must be expressed in general form.

3. [2] Find the gradient of the line  $2x + 3y = 12$ .

4. [2] The point  $(k, 2)$  lies on the line  $5x + 2y = 19$ . Find the value of  $k$ .

5. [4] Prove the points  $(2, 3)$ ,  $(-2, -5)$  and  $(0, -1)$  are collinear.

6. [4] The points  $A(3, 5)$ ,  $B(9, -3)$ ,  $C(5, -6)$  and  $D(-1, 2)$  form a quadrilateral. Prove that the diagonals are equal and bisect one another. What type of quadrilateral is  $ABCD$ ? Illustrate

with a sketch.

7. [2] Find the equation of the straight line with gradient  $-4$  and passing through the point  $(-2, 3)$ .

8. [3] Find the equation of the straight line that passes through the points  $(2, -3)$  and  $(-4, -7)$ .

9. [2] Prove that the straight lines  $5x - 2y - 1 = 0$  and  $5x - 2y + 7 = 0$  are parallel.

10. [2] Show that the lines  $3x - y - 11 = 0$  and  $x - 3y - 1 = 0$  are perpendicular.

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*Extra space for answers or working out*