

## CO- ORDINATE GEOMETRY REVIEW

Please complete the following questions:

PART 1: # 12

- 11 The perpendicular bisector of the straight line joining the points (3, 2) and (5, 6) meets the  $x$ -axis at A and the  $y$ -axis at B. Prove that the distance AB is equal to  $6\sqrt{5}$ .
- 12 A is the point (1, 2) and B is the point (7, 4). The straight line  $l_1$  passes through B and is perpendicular to AB; the straight line  $l_2$  passes through A and is also perpendicular to AB. The line  $l_1$  meets the  $x$ -axis at P and the  $y$ -axis at Q; the line  $l_2$  meets the  $x$ -axis at R and the  $y$ -axis at S.
- Find the equations of each of the lines  $l_1$  and  $l_2$ .
  - Calculate the area of the triangle OPQ.
  - Calculate the area of the triangle ORS.
  - Deduce that the area of the trapezium PQSR is 100.
- 13 P is the point with coordinates (2, 1), and  $l$  is the straight line which is perpendicular to OP and which passes through the point P.
- Find the equation of  $l$ .
- Given further that the line  $l$  meets the  $x$ -axis at A and the  $y$ -axis at B.
- calculate the area of the triangle OAP
  - calculate the area of the triangle OBP

PART II: #7, #8 and # 10

- 5 Find the equation of the perpendicular bisector of the straight line joining each of the following pairs of points.
- |                       |                       |                        |
|-----------------------|-----------------------|------------------------|
| a) (2, 3) and (6, 5)  | b) (2, 0) and (6, 4)  | c) (2, -5) and (4, -1) |
| d) (5, 4) and (2, -2) | e) (-1, 4) and (3, 3) | f) (3, 2) and (-4, 1)  |
- 6 A straight line  $l$ , of positive gradient, passes through the point (2, 5) and makes an angle of  $45^\circ$  with the horizontal. Find the equation of  $l$ .
- 7 A straight line  $l$ , of negative gradient, passes through the point (3, -1) and makes an angle of  $45^\circ$  with the horizontal. Find the equation of  $l$ .
- 8 Find the equation of the straight line,  $p$ , which is the perpendicular bisector of the straight line joining the points (1, 2) and (5, 4). The line  $p$  meets the  $x$ -axis at A and the  $y$ -axis at B. Calculate the area of the triangle OAB.
- 9 Find the equation of the straight line,  $p_1$ , which is the perpendicular bisector of the points A(-2, 3) and B(1, -5), and the equation of the straight line,  $p_2$ , which is the perpendicular bisector of the points B(1, -5) and C(17, 1). Show that  $p_1$  is perpendicular to  $p_2$ .
- 10 The perpendicular bisector of the straight line joining the points (3, 2) and (5, 6) meets the  $x$ -axis at A and the  $y$ -axis at B. Prove that the distance AB is equal to  $6\sqrt{5}$ .

PART III: # 13 and # 16

- 13 Three points have coordinates  $L(2, 5)$ ,  $M(-2, 3)$  and  $N(4, 9)$ . Find
- the equation of the perpendicular bisector,  $p$ , of  $LM$
  - the coordinates of the point where  $p$  meets  $MN$ .
- 14 Calculate the size of the smallest angle of the triangle which has sides given by the equations  $x + y = 6$ ,  $2y = x$  and  $2x - 5y = 2$ .
- 15  $P$ ,  $Q$  and  $R$  are the points  $(3, 8)$ ,  $(-3, 4)$  and  $(5, 6)$  respectively. Find the equations of the perpendicular bisectors of  $PQ$ ,  $QR$  and  $RP$  and show that all three are concurrent.
- 16 Points  $P$ ,  $Q$  and  $R$  have coordinates  $(1, -2)$ ,  $(7, 6)$  and  $(9, 2)$  respectively.
- Find the coordinates of the point  $S$ , where the perpendicular bisector of the line  $PQ$  meets the perpendicular bisector of the line  $QR$ .
  - Explain why the points  $P$ ,  $Q$  and  $R$  lie on a circle with centre  $S$ , and calculate the radius of the circle.
- 17 Points  $C$ ,  $D$  and  $E$  have coordinates  $(6, p)$ ,  $(2, p + 2)$  and  $(-1, p + 1)$  respectively, and lie on a circle with centre  $(p, q)$ .
- Find the equation of the perpendicular bisector of  $CD$  and deduce that  $3p - q = 7$ .
  - Find the equation of the perpendicular bisector of  $DE$  and deduce that  $2p + q = 3$ .
  - Hence find the values of  $p$  and  $q$ .