Pearson Edexcel AS Mathematics 8MA0

Unit Test 2 Coordinate Geometry

Time allowed: 50 minutes
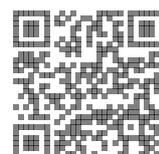
School:

Name:

Teacher:

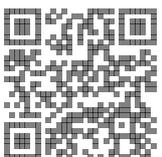| Question	Points	Score
1	9	
2	6	
3	7	
4	9	
5	19	
Total:	50	

How I can achieve better:

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1. The points A and B have coordinates $(3k - 4, -2)$ and $(1, k + 1)$ respectively, where k is a constant. Given that the gradient of AB is $-\frac{3}{2}$:

   (a) show that $k = 3$ [2]

   (b) find an equation of the line through A and B [3]

   (c) find an equation of the perpendicular bisector of A and B, leaving your answer in the form [4]

   $ax + by + c = 0$ where a, b and c are integers.

   Total: 9

2. (a) Find an equation of the straight line passing through the points with coordinates $(4, -7)$ [3]

    and $(-6, 11)$, giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.

    (b) The line crosses the x-axis at point A and the y-axis at point B and O is the origin.   [3]

    Find the area of triangle AOB.
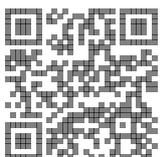
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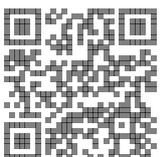
3. The line with equation $mx - y - 2 = 0$ touches the circle with equation [7]

$$x^2 + 6x + y^2 - 8y = 4.$$

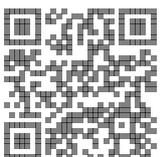Find the two possible values of m, giving your answers in exact form.

4. The equations of two circles are

$$x^2 + 10x + y^2 - 12y = 3 \quad \text{and} \quad x^2 - 6x + y^2 - 2qy = 9.$$
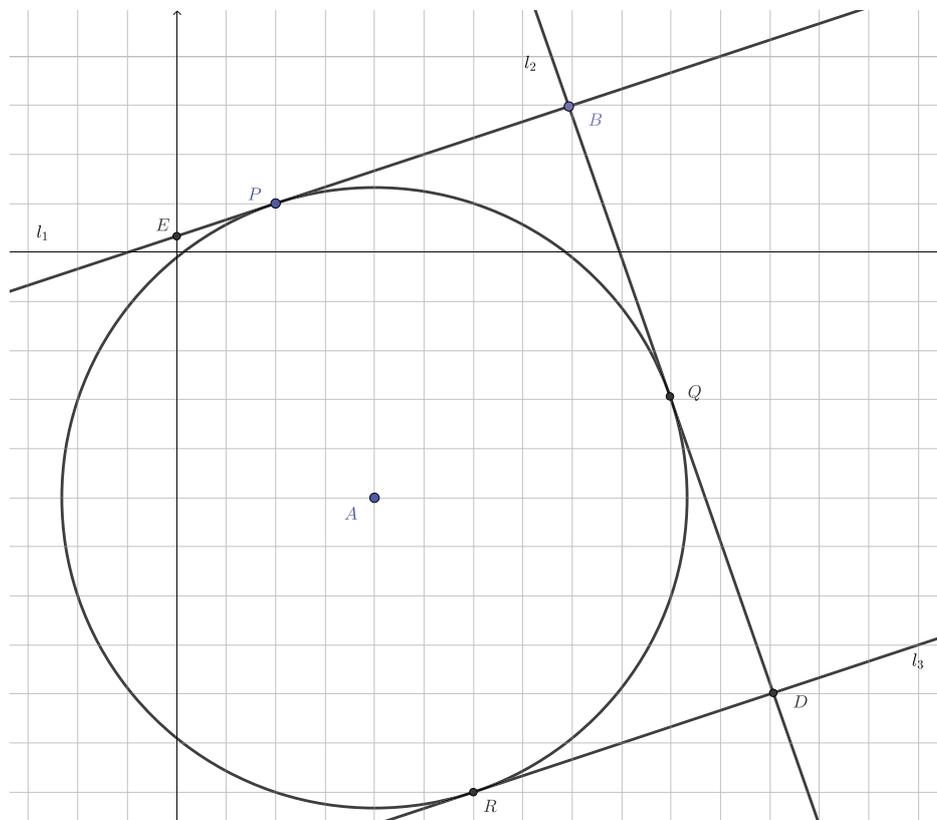
(a) Find the centre and radius of each circle, giving your answers in terms of q where necessary. [6]

(b) Given that the distance between the centres of the circles is $\sqrt{80}$, find the two possible [3] values of q.

Total: 9

5. A is the centre of circle C, with equation $x^2 - 8x + y^2 + 10y + 1 = 0$. P, Q and R are points on
   the circle and the lines l_1, l_2 and l_3 are tangents to the circle at these points respectively.
   Line l_2 intersects line l_1 at B and line l_3 at D.
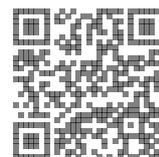

   (a) Find the centre and radius of C.   [3]

   (b) Given that the x-coordinate of Q is 10 and that the gradient of AQ is positive, find the   [4]
       y-coordinate of Q, explaining your solution.

   (c) Find the equation of l_2, giving your answer in the form $y = mx + b$.   [4]

   (d) Given that $APBQ$ is a square, find the equation of l_1 in the form $y = mx + b$.   [4]

   l_1 intercepts the y-axis at E.

   (e) Find the area of triangle EPA.   [4]
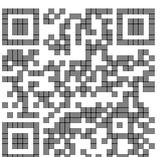
                                                                              Total: 19

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