

Pearson Edexcel AS Mathematics 8MA0

Practice Paper B

Time allowed: 2 hours

School: www.CasperYC.club

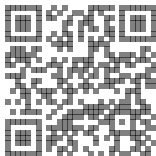
Name:

Teacher:

How I can achieve better:

-
-
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Question	Points	Score
1	3	
2	3	
3	4	
4	6	
5	6	
6	6	
7	7	
8	8	
9	8	
10	8	
11	9	
12	13	
13	19	
Total:	100	



- The attempt is shown below.

$$\cos(2x) = -\frac{\sqrt{3}}{2}$$

$$2x = \cos^{-1} \left(-\frac{\sqrt{3}}{2} \right)$$

$$x = 75^\circ$$

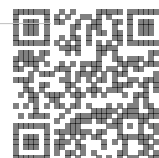
(a) Identify the mistake made by the student.

$$[1]$$

- [2]

Total: 3

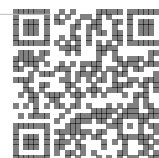
[3]



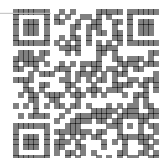
[4]

$$\frac{6\sqrt{3} - 4}{8 - \sqrt{3}},$$

giving your answer in the form $p\sqrt{3} - q$, where p and q are positive rational numbers.



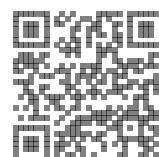
- Total: 6



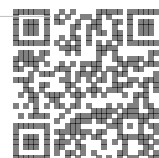
[6]

$$h'(x) = 15x\sqrt{x} - \frac{40}{\sqrt{x}},$$

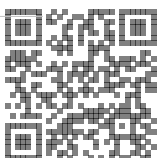
find $h(x)$.



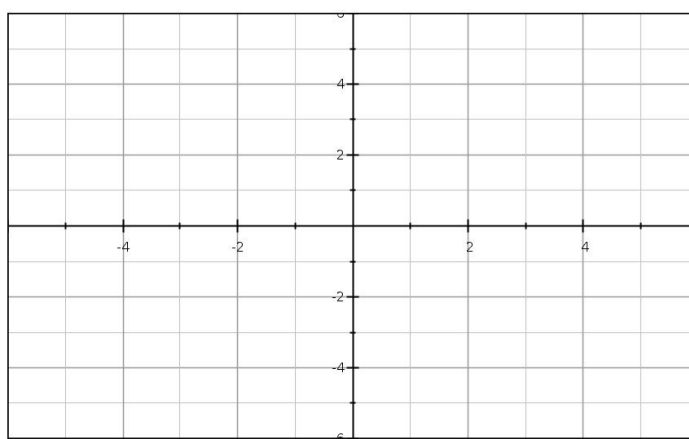
- Total: 7



- Total: 8

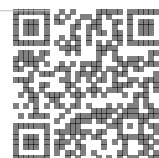


9. (a) On the grid shade the region comprising all points whose coordinates satisfy the inequalities $y \leq 2x + 5$, $2y + x \leq 6$ and $y \geq 2$. [3]



- (b) Work out the area of the shaded region. [5]

Total: 8



$$F_1 = (8\mathbf{i} - 10\mathbf{j})\text{N} \quad \text{and} \quad F_2 = (p\mathbf{i} + q\mathbf{j})\text{N}$$

The acceleration of P is $a = (3\mathbf{i} - 2\mathbf{j}) \text{ ms}^{-2}$.

- (a) Find, to 1 decimal place, the angle between the acceleration and \mathbf{i} . [2]
- (b) Find the values of p and q . [3]
- (c) Find the magnitude of the resultant force R of the two forces F_1 and F_2 . [3]

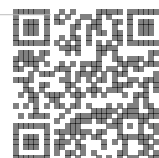
Total: 8

11.

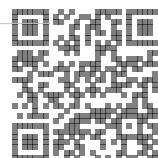
[9]

- Sketch the graph of the gradient function, $y = f'(x)$.
- Use algebraic methods to determine any points where the graph cuts the coordinate axes and mark these on the graph.
- Using calculus, find the coordinates of any turning points on the graph.

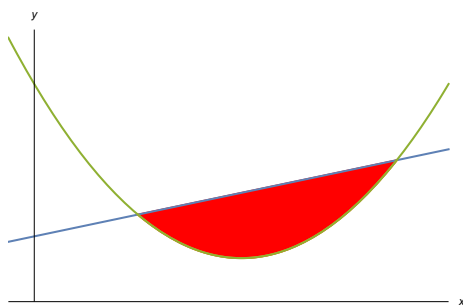
Total: 9



(Q11 continued ...)

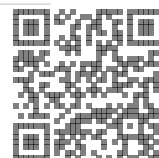


12. The diagram shows part of curve with equation $y = x^2 - 8x + 20$ and part of the line with equation $y = x + 6$.

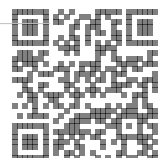


- (a) Using an appropriate algebraic method, find the coordinates of A and B . [4]
- (b) The x -coordinates of A and B are denoted x_A and x_B respectively. [2]
- Find the exact value of the area of the finite region bounded by the x -axis, the lines $x = x_A$ and $x = x_B$ and the line AB .
- (c) Use calculus to find the exact value of the area of the finite region bounded by the x -axis, [5]
- the lines $x = x_A$ and $x = x_B$ and the curve $y = x^2 - 8x + 20$.
- (d) Hence, find, to one decimal place, the area of the shaded region enclosed by the curve [2]
- $y = x^2 - 8x + 20$ and the line AB .

Total: 13



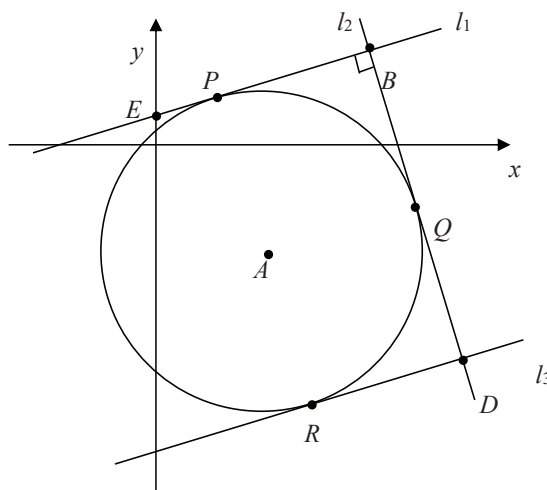
(Q12 continued ...)



13. 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 y coordinate of Q , explaining your solution. [4]
- (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]
- (e) l_1 intercepts the y -axis at E . Find the area of triangle EPA . [4]

Total: 19

