Solomon Practice Paper

Pure Mathematics 1H

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

Question	Points	Score
1	6	
2	6	
3	8	
4	9	
5	9	
6	10	
7	12	
8	15	
Total:	75	

How I can achieve better:

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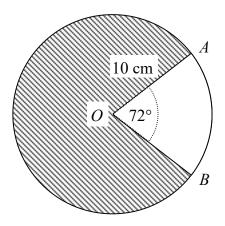
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1. Figure shows a circle, centre O, of radius 10 cm.

(a) the perimeter of the unshaded minor sector,



Points A and B are on the circumference of the circle and the acute angle AOB is 72° . Giving your answers in terms of π , calculate

(b) the area of the shaded major sector.	[3]
	Total: 6

[3]

[6]

2.	Given that
	$x(x^2 - A)\left(x - \frac{2}{x}\right) \equiv \left(x^2 + B\right)^2$
	Find the value of the constants A and B .



3.	The line $x - 2y + 8 = 0$ crosses the x-axis at the point P and the y-axis at the point Q.	
	(a) Find the coordinates of the points P and Q .	[3]
	(b) State the coordinates of the midpoint of PQ .	[1]
	(w) we will see a	[-]
	Given that P and Q are diagonally opposite corners of a square,	
	(c) find an equation of the line that passes through the other two corners of the square.	[4]
		Total: 8

4.	(a) Solve the equation	[3]
	$3x - \frac{2}{x} = 5.$	
	(b) Hence find the values of θ in the interval $-180^{\circ} \leq \theta \leq 180^{\circ}$ for which	[6]

$$3\tan(\theta) - \frac{2}{\tan(\theta)} = 5.$$

Give your answers correct to 1 decimal place.

	Total: 9
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5.

$$f(x) \equiv 2x^2 + 4px + q.$$

Given that the curve $y = f(x)$	does not intersect the x -axis,

(a) prove that $2p^2 - q < 0$. [3]

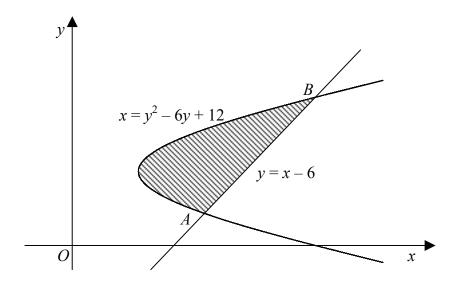
Given also that the curve y = f(x) passes through the point (2, 18),

(b)	find an expression for q in terms of p .	[2]
(c)	Using your answers to parts (a) and (b), find the set of possible values of p .	[4]
		Total: 9



6.	The sum, S_n , of the first n terms of a sequence is given by $S_n = 5n^2 + 2n$.	
	(a) Evaluate S_3 and S_4 .	[3]
	(b) Write down the value of the fourth term of the sequence.	[1]
	(c) Show that the sum of the first $(n-1)$ terms is given by $S_{n-1} = 5n^2 - 8n + 3$.	[3]
	(d) Hence, or otherwise find an expression for the n th term of the sequence in terms of n .	[3]
	10	otal: 10

7. Figure shows the curve $x = y^2 - 6y + 12$ and the line y = x - 6.



The line and the curve intersect at the points A and B.

(a)	and the coordinates of the points A and B .	Į,	(
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(b) Hence show that the area of the shaded region enclosed by the curve and the line is $\frac{125}{6}$.	Į,
	Total: 1
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8.

$$f(x) \equiv x^2 - 4\sqrt{x}, \quad x \ge 0.$$

$I(x) = x$ $Y(x), x \geq 0.$	
(a) Solve the equation $f(x) = 0$, giving your solutions to an appropriate degree of accuracy.	[4]
The curve $y = f(x)$ has a stationary point, P .	
(b) Find $f'(x)$ and determine the coordinates of the point P .	[5]
(c) Find $f''(x)$ and hence show that P is a minimum point of the curve.	[3]
(d) Sketch the curve $y = f(x)$, labelling P and the coordinates of any points where the curve crosses the coordinate axes.	[3]
ŗ	Total: 15



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