

Solomon Practice Paper

Pure Mathematics 2F

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

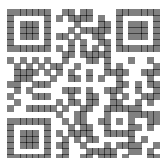
Question	Points	Score
1	5	
2	7	
3	8	
4	9	
5	11	
6	11	
7	12	
8	12	
Total:	75	

How I can achieve better:

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Last updated: May 5, 2023



1. (a) Find

[2]

$$\int 2x - 3e^x dx.$$

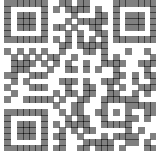
Given that $f'(x) = 2x - 3e^x$ and that the curve $y = f(x)$ meets the y -axis at the point $(0, 6)$,

(b) find $f(x)$.

[3]

Total: 5

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- 2. (a) Sketch on the same set of coordinate axes the graphs of $y = x^2 + 1$ and $y = |2x - 4|$. [3]
- (b) Hence, or otherwise, solve the equation $x^2 + 1 = |2x - 4|$. [4]

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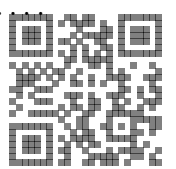
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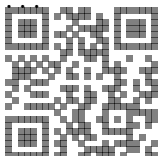
3. (a) Find the first three terms in the expansion of $(2 + kx)^5$ in ascending powers of x , simplifying each coefficient. [3]

Given that the coefficient of x^2 in the expansion of $(1 - x)(2 + kx)^5$ is 60,

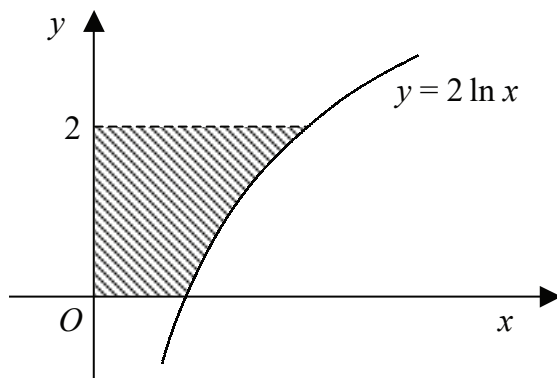
- (b) find the two possible values of k . [5]

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5. Figure shows part of the curve $y = 2 \ln(x)$.



(a) Write the equation of the curve in the form $x = f(y)$. [2]

The shaded region is enclosed by the curve, the positive coordinate axes and the line $y = 2$.

(b) Use the trapezium rule with 4 intervals of equal width to estimate the area of the shaded region correct to 3 significant figures. [4]

(c) Find the volume of the solid generated when the shaded region is rotated through 360° about the y -axis. Give your answer in terms of e and π . [5]

Total: 11

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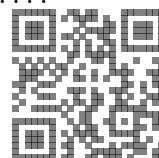
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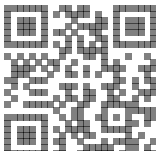
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6.

$$f(x) \equiv \sqrt{3} \sin(x) + \cos(x).$$

(a) Express $f(x)$ in the form $R \sin(x + \alpha)$ where x is measured in degrees and $0 < \alpha < 90^\circ$. [5]

(b) State the maximum value of $(\sqrt{3} \sin(x) + \cos(x))$ and the smallest positive value of x for which $f(x)$ takes this value. [2]

(c) Solve the equation $f(x) = \sqrt{2}$, for x in the interval $0 \leq x \leq 360^\circ$. [4]

Total: 11

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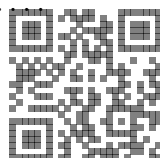
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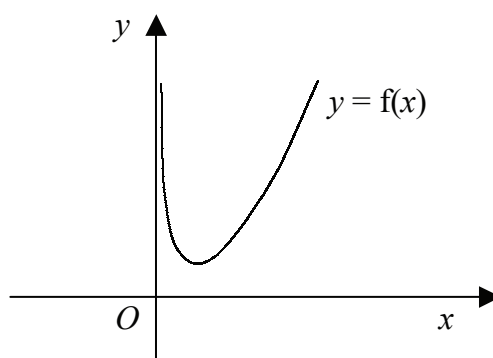
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8. Figure shows part of the curve with equation $y = f(x)$ where

$$f(x) \equiv kx^{\frac{3}{2}} - \frac{7}{8}\ln(4x).$$



Given that the curve passes through the point $A(\frac{1}{4}, \frac{1}{2})$,

- (a) show that $k = 4$, [3]
- (b) find $f'(x)$, [3]
- (c) prove that the normal to the curve at the point A passes through the origin. [6]

Total: 12

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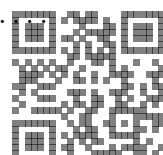
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