

Solomon Practice Paper

Core Mathematics 4D

Time allowed: 90 minutes

Centre: www.CasperYC.club

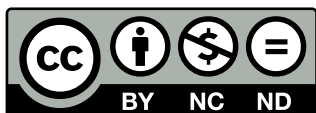
Name:

Teacher:

Question	Points	Score
1	6	
2	8	
3	10	
4	12	
5	12	
6	13	
7	14	
Total:	75	

How I can achieve better:

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Last updated:

June 17, 2025

- Total: 6

$$x^2 + 3xy - 2y^2 + 17 = 0.$$

- Total: 8

- [5]

(b) Evaluate

[5]

Total: 10

- She uses the model

$$\frac{dx}{dt} = \frac{k(5-t)}{x},$$

Given that after two hours she has made sales of £96 in total,

- The mathematician believes that is it not worth staying at the sale once she is making sales at a rate of less than £10 per hour.

- (b) Verify that at 3 hours and 5 minutes after the start of the sale, she should have already left. [4]

Total: 12

$$\mathbf{r} = \begin{pmatrix} 4 \\ 1 \\ 1 \end{pmatrix} + s \begin{pmatrix} 1 \\ 4 \\ 5 \end{pmatrix} \quad \text{and} \quad \mathbf{r} = \begin{pmatrix} -3 \\ 1 \\ -6 \end{pmatrix} + t \begin{pmatrix} 3 \\ a \\ b \end{pmatrix},$$

Given that the two lines are perpendicular,

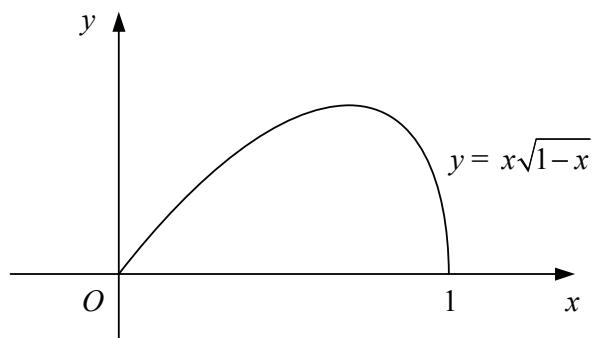
- Given also that the two lines intersect,

- (c) find the coordinates of the point where they intersect. [2]

Total: 12

6. Figure shows the curve with equation

$$y = x\sqrt{1-x}, \quad 0 \leq x \leq 1.$$



- (a) Use the substitution $u^2 = 1 - x$ to show that the area of the region bounded by the curve and the x -axis is $\frac{4}{15}$. [8]
- (b) Find, in terms of π , the volume of the solid formed when the region bounded by the curve and the x -axis is rotated through 360° about the x -axis. [5]

Total: 13

$$x = 3 \cos^2(t), \quad \text{and} \quad y = \sin(2t), \quad 0 \leq t < \pi.$$

[4]

[3]

[3]

[4]

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