

Solomon Practice Paper

Pure Mathematics 3L

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

Question	Points	Score
1	5	
2	6	
3	7	
4	8	
5	9	
6	12	
7	13	
8	15	
Total:	75	

How I can achieve better:

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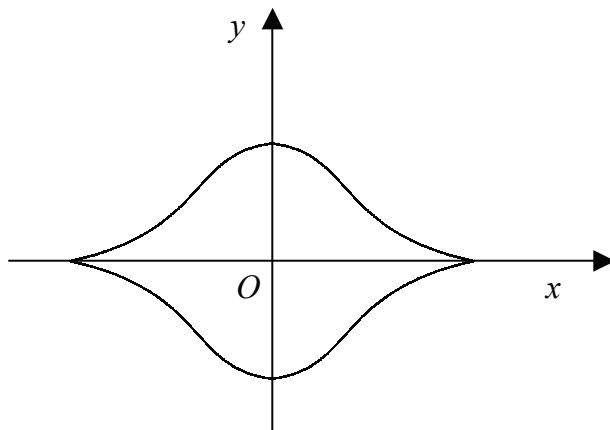
Last updated: December 24, 2025



8. Figure shows the curve given by the parametric equations

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

where t is a parameter.



(a) Find the coordinates of the points A and B with parameters $t = 0$ and $t = \frac{\pi}{2}$ respectively. [2]

(b) Show that the area of the region enclosed by the curve is given by the integral [5]

$$\int_0^{\frac{\pi}{2}} 8 \sin^4(t) dt.$$

(c) Use the double angle identities to prove that [4]

$$\sin^4(A) = \frac{1}{8} (3 - 4 \cos(2A) + \cos(4A)).$$

(d) Find the area of the region enclosed by the curve, giving your answer in terms of π . [4]

Total: 15

