

Solomon Practice Paper

Pure Mathematics 3I

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

Question	Points	Score
1	5	
2	7	
3	9	
4	10	
5	11	
6	16	
7	17	
Total:	75	

How I can achieve better:

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-

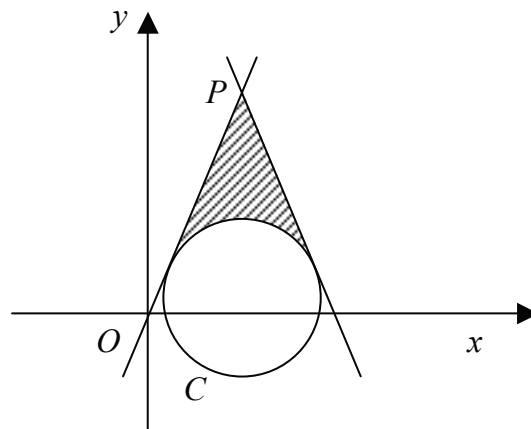


Last updated: December 24, 2025



3. Figure shows the circle C with equation

$$x^2 + y^2 - 12x - 2y + 12 = 0.$$

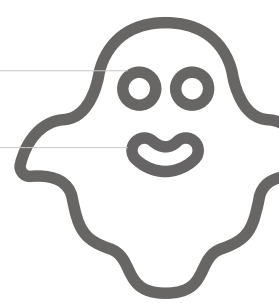


(a) Find the coordinates of the centre of C and write down its radius. [4]

The shaded region in the diagram is enclosed by C and the two tangents to C which pass through the point P with coordinates $(6, 14)$.

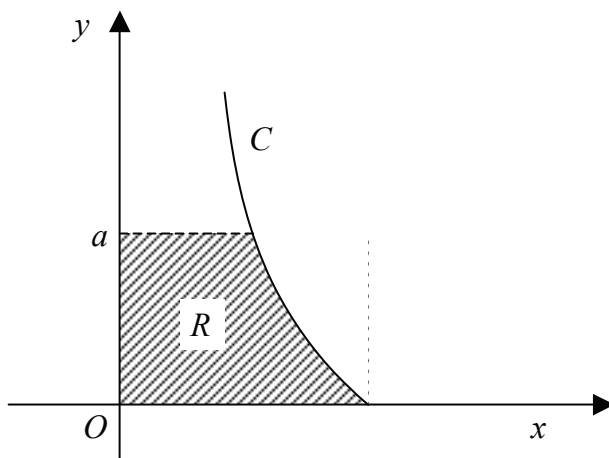
(b) Show that the area of the shaded region is 30.6, correct to 3 significant figures. [5]

Total: 9



7. Figure shows the curve C which is defined by the parametric equations

$$x = 2a \cos(t), \quad \text{and} \quad y = a \tan^2(t), \quad 0 \leq t \leq \frac{\pi}{2},$$



where t is a parameter and a is a positive constant.

- (a) Find and simplify an expression for $\frac{dy}{dx}$ in terms of t . [5]

The point P on C has parameter $t = \frac{\pi}{3}$

- (b) Find an equation of the tangent to C at the point P . [4]

- (c) Show that a Cartesian equation of C is [3]

$$x^2 = \frac{4a^3}{a + y}.$$

The shaded region R is bounded by C , the positive coordinate axes, and the line $y = a$.

- (d) Find the volume of the solid generated when the region R is rotated through 2π radians about the y -axis. [5]

Total: 17

