

Solomon Practice Paper

Core Mathematics 2F

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

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

How I can achieve better:

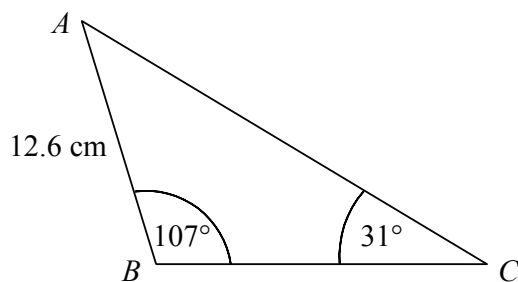
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Last updated: July 14, 2025



1. Figure shows triangle ABC in which $AB = 12.6\text{cm}$, $\angle ABC = 107^\circ$ and $\angle ACB = 31^\circ$.



Find, to 3 significant figures,

(a) the length BC ,

[3]

(b) the area of triangle ABC .

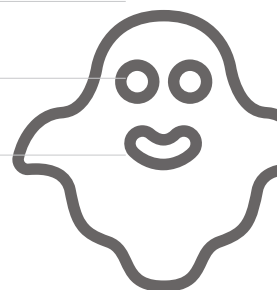
[2]

Total: 5

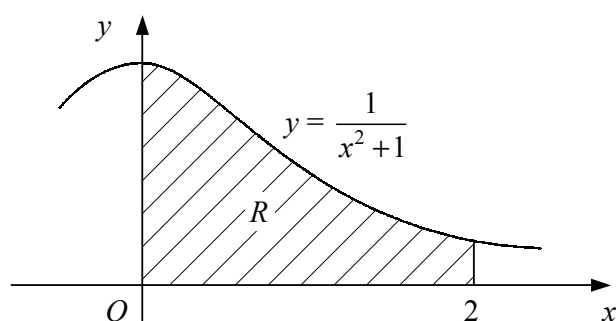


[6]

where k is an integer to be found.



3. Figure shows the curve with equation $y = \frac{1}{x^2+1}$.



The shaded region R is bounded by the curve, the coordinate axes and the line $x = 2$.

(a) Use the trapezium rule with four strips of equal width to estimate the area of R .

The cross-section of a support for a bookshelf is modelled by R with 1 unit on each axis representing 8 cm. Given that the support is 2 cm thick,

(b) find an estimate for the volume of the support.

Total: 7



4. (a) Expand $(2+y)^6$ in ascending powers of y as far as the term in y^3 , simplifying each coefficient. [4]
- (b) Hence expand $(2+x-x^2)^6$ in ascending powers of x as far as the term in x^3 , simplifying each coefficient. [3]

Total: 7



5. (a) Given that

[3]

$$8 \tan(x) - 3 \cos(x) = 0,$$

show that

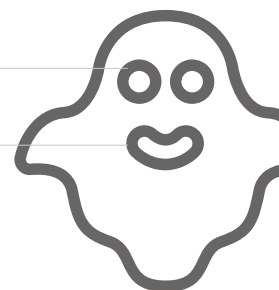
$$3 \sin^2(x) + 8 \sin(x) - 3 = 0.$$

(b) Find, to 2 decimal places, the values of x in the interval $0 \leq x \leq 2\pi$ such that

[5]

$$8 \tan(x) - 3 \cos(x) = 0.$$

Total: 8



6. (a) Given that $y = 3^x$, find expressions in terms of y for [4]
- i. 3^{x+1} ,

ii. 3^{2x-1} .

- (b) Hence, or otherwise, solve the equation [5]

$$3^{x+1} - 3^{2x-1} = 6,$$

giving non-exact answers to 2 decimal places.

Total: 9

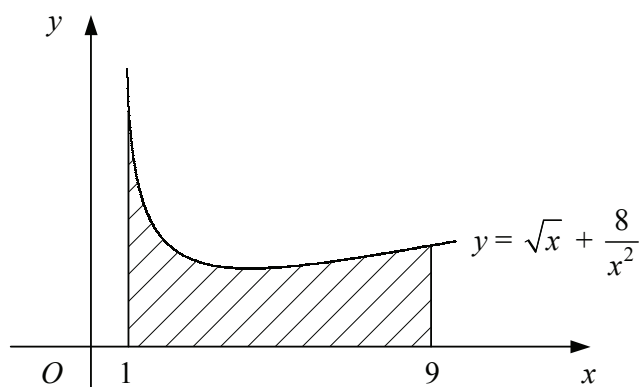


7. The circle C has centre $(5, 2)$ and passes through the point $(7, 3)$.
- (a) Find the length of the diameter of C . [2]
 - (b) Find an equation for C . [2]
 - (c) Show that the line $y = 2x - 3$ is a tangent to C and find the coordinates of the point of contact. [5]

Total: 9



8. Figure shows the curve with equation $y = \sqrt{x} + \frac{8}{x^2}$, $x > 0$.



- (a) Find the coordinates of the minimum point of the curve. [7]
- (b) Show that the area of the shaded region bounded by the curve, the x -axis and the lines $x = 1$ and $x = 9$ is $24\frac{4}{9}$. [5]

Total: 12



9. The first three terms of a geometric series are $(x - 2)$, $(x + 6)$ and x^2 respectively.

(a) Show that x must be a solution of the equation

[3]

$$x^3 - 3x^2 - 12x - 36 = 0. \quad (\star)$$

(b) Verify that $x = 6$ is a solution of equation (\star) and show that there are no other real solutions.

[6]

Using $x = 6$,

(c) find the common ratio of the series,

$$[1]$$

(d) find the sum of the first eight terms of the series.

[2]

Total: 12

