Solomon Practice Paper

Core Mathematics 1C

Time allowed: 90 minutes

Centre: www.CasperYC.club

Name:

Teacher:

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July 14, 2025



Question	Points	Score
1	3	
2	4	
3	6	
4	6	
5	7	
6	7	
7	8	
8	8	
9	12	
10	14	
Total:	75	

1. Solve the equation

 $x^2 - 4x - 8 = 0,$

giving your answers in the form $a + b\sqrt{3}$ where a and b are integers.



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2. Find the set of values of x for which

(x-1)(x-2) < 20.

3. The curve with equation y = f(x) passes through the point (8,7). Given that

$$f'(x) = 4x^{\frac{1}{3}} - 5,$$

find f(x).



- 4. (a) Evaluate $(5\frac{4}{9})^{-\frac{1}{2}}$
 - (b) Find the value of x such that

$$\frac{1+x}{x} = \sqrt{3},$$

giving your answer in the form $a + b\sqrt{3}$ where a and b are rational.

[2]

[4]

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[3]

[4]

Total: 7

5. Given that

(a) find $\frac{\mathrm{d}y}{\mathrm{d}x}$,

(b) find $\int y \, \mathrm{d}x$.

$$y = x + 5 + \frac{3}{\sqrt{x}},$$



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6.

$$f(x) = x^{\frac{3}{2}} - 8x^{-\frac{1}{2}}$$

(a) Evaluate f(3), giving your answer in its simplest form with a rational denominator. [3]
(b) Solve the equation f(x) = 0, giving your answers in the form k√2. [4]

Total: 7



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- 7. The straight line l_1 has gradient 2 and passes through the point with coordinates (4, -5).
 - (a) Find an equation for l_1 in the form y = mx + c.

The straight line l_2 is perpendicular to the line with equation 3x - y = 4 and passes through the point with coordinates (3, 0).

- (b) Find an equation for l_2 .
- (c) Find the coordinates of the point where l_1 and l_2 intersect.

[3] [3]

[2]

Total: 8

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8. Figure shows the graph of y = f(x).





9. (a) Prove that the sum of the first n terms of an arithmetic series with first term a and common [4] difference d is given by

$$\frac{1}{2}n\left[2a+(n-1)d\right].$$

A novelist begins writing a new book. She plans to write 16 pages during the first week, 18 during the second and so on, with the number of pages increasing by 2 each week.

Find, according to her plan,

(b) how many pages she will write in the fifth week,	[2]
(c) the total number of pages she will write in the first five weeks.	[2]
(d) Using algebra, find how long it will take her to write the book if it has 250 pages.	[4]
	Total: 12



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10. The curve C has the equation y = f(x) where

 $f(x) = (x+2)^3.$

(a)) Sketch the curve C , showing the coordinates of any points of intersection with the coordinate	
	axes.	
(b)	Find $f'(x)$.	[4]
The	straight line l is the tangent to C at the point $P(-1, 1)$.	
(c)	Find an equation for l .	[3]
The	straight line m is parallel to l and is also a tangent to C .	
(d)	Show that m has the equation $y = 3x + 8$.	[4]

Total: 14

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