

Sample solutions to the 2023 VCAA papers

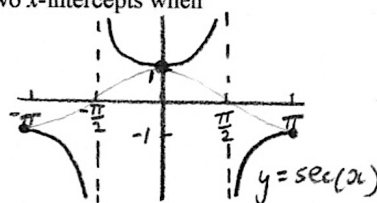
Specialist Mathematics Examination 2

Question 3

In the interval $-\pi \leq x \leq \pi$, the graph of $y = a + \sec(x)$, where $a \in \mathbb{R}$, has two x -intercepts when

- A. $0 \leq a \leq 1$
B. $-1 < a < 1$
C. $a \leq -1$ or $a > 1$
D. $-1 \leq a < 0$
E. $a < -1$ or $a \geq 1$

For two x -intercepts:
translate down by more than 1
or
translate up by 1 or more



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Mathematical Methods Examination 2

Question 3

Two functions, p and q , are continuous over their domains, which are $[-2, 3)$ and $(-1, 5]$, respectively.

The domain of the sum function $p + q$ is

- A. $[-2, 5]$
B. $[-2, -1) \cup (3, 5]$
C. $[-2, -1) \cup (-1, 3) \cup (3, 5]$
D. $[-1, 3]$
E. $(-1, 3)$

$$[-2, 3) \cap (-1, 5] = (-1, 3)$$

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General Mathematics Examination 1

Question 17

A sequence of numbers is generated by the recurrence relation shown below.

$$T_0 = 5, \quad T_{n+1} = -T_n$$

The value of T_2 is

- A. -10
B. -5
C. 0
D. 5
E. 10

$$T_1 = -5$$
$$T_2 = -(-5) = 5$$

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Foundation Mathematics Examination

Question 16

A nail manufacturer sets a machine tolerance for nail length at a minimum of 38.5 mm and a maximum of 38.8 mm.

The machine tolerance for the nail length could best be written as

- A. 38 mm \pm 0.5 mm
B. 38.65 mm \pm 0.15 mm
C. 38.65 mm \pm 1.5 mm
D. 38.0 mm \pm 0.1 mm
E. 38.9 mm \pm 38.4 mm

$$\frac{38.8 + 38.5}{2} = 38.65 = \text{mean}$$

$$\frac{38.8 - 38.5}{2} = 0.15 = \text{variation}$$

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