

APPC FRQ #1

2026

$$A_i) h(2) = g(f(2)) \Rightarrow g(5) \approx -1.613946$$

$$h(2) \approx -1.614$$

$$A_{ii}) f(x) = 3 \text{ when } x = 1$$

$$B_i) g(x) = -1.5$$

$$x \approx 5.4827$$

$$x \approx 5.483$$

$$B_{ii}) \lim_{x \rightarrow 1^+} g(x) = -\infty$$

C_i.) yes, f is invertible.

C_{ii}) Each output value on the graph of f is mapped from a unique input value on $-3 \leq x \leq 3$.

APPC FRQ #2

2026

Ai) $(1, 27.2)$ $(6, 14.8)$

$$27.2 = ab^1$$

$$14.8 = ab^6$$

Aii) $a = 30.7206458496 \approx 30.721$

$$b = 0.88539805228 \approx 0.885$$

Bi) $\frac{V(6) - V(1)}{6 - 1} = \frac{14.8 - 27.2}{6 - 1} = -2.48$

Bii) $y - 27.2 = -2.48(3 - 1)$

$$y = 22.24 \text{ thousand dollars}$$

Biii) $V(t)$ is a concave up, exponential function. For $1 < t < 6$, the secant line lies above the model and $A(t) > V(t)$

C.) $V(t) = 2$

$$t = 22.443587613$$

$$t \approx 22.444$$

In the 22nd year the value of the car will reach \$2000.

APPC FRQ #3

2026

A) period = 10 sec

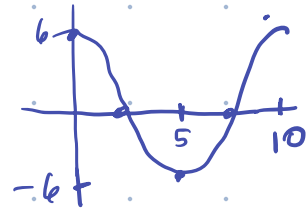
$$F = (0, 6)$$

$$G = (2.5, 0)$$

$$J = (5, -6)$$

$$K = (7.5, 0)$$

$$P = (10, 6)$$



$$\frac{2\pi}{10} = b$$

$$\pi/5 = b$$

B) $h(t) = a \sin[b(t+c)] + d$

$$a = 6$$

$$a = 6$$

$$b = \pi/5$$

$$b = \pi/5$$

$$c = 2.5$$

$$c = -2.5$$

$$d = 0$$

$$d = 0$$

Ci) C. h is negative and increasing

Cii) The model is concave up on the interval (t_1, t_2) so the rate of change of h is increasing.

APPC FRQ #4

2026

$$\text{Ai.) } e^{2x} = \frac{1}{e^6}$$

$$e^{2x} = e^{-6}$$

$$2x = -6$$

$$\underline{x = -3}$$

$$\text{Aii.) } \log_2(5x) = 3$$

$$5x = 2^3$$

$$x = \frac{8}{5}$$

$$\text{Bi.) } j(x) = 7^{(3x+1)} \cdot 7^x$$

$$\underline{j(x) = 7^{4x+1}}$$

$$\text{Bii.) } k(x) = \sin(2x) \sec x$$

$$k(x) = (2 \sin x \cos x) \left(\frac{1}{\cos x} \right)$$

$$\underline{k(x) = 2 \sin x}$$

$$\text{C.) } m(x) = \tan^2(3x)$$

$$\tan^2(3x) = 1$$

$$\tan 3x = \pm 1$$

$$\tan x = \pm 1$$

$$x = \pi/4, 3\pi/4, 5\pi/4$$

$$3x = \pi/4$$

$$3x = \frac{3\pi}{4}$$

$$3x = \frac{5\pi}{4}$$

$$[0, \pi/2]: \quad x = \frac{\pi}{12}$$

$$x = \frac{\pi}{4}$$

$$x = \frac{5\pi}{12}$$