

Trigonometry – Answers

Problem 1

(a) $-\frac{1}{2}$

(b) $\frac{1}{2}$

(c) -1

(d) $\frac{3}{5}$

(e) $-\frac{12}{13}$

Problem 2

(a) $\alpha \in \{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}\}$

(b) $\alpha \in \{\frac{\pi}{5}, \frac{3\pi}{5}, \pi, \frac{7\pi}{5}, \frac{9\pi}{5}\}$

(c) $\alpha \in \{\frac{\pi}{4}, \frac{5\pi}{4}\}$

Problem 3

(a) $f'(x) = 2 \cos(2x)$

(b) $f'(x) = \cos(2x) = \cos^2(x) - \sin^2(x)$

(c) $f'(x) = \frac{\sin(x)}{\cos^2(x)} = \frac{\tan(x)}{\cos(x)}$

(d) $f'(x) = 3 \sin^2(x) \cos x + 4 \sin x \cos x$

Problem 4

(a) $\frac{d^2}{dx^2}(\sin x) = -\sin x$ $\frac{d^2}{dx^2}(\cos x) = -\cos(x)$

(b) $\frac{d^4}{dx^4}(\sin x) = \sin x$ $\frac{d^4}{dx^4}(\cos x) = \cos(x)$

(c) $\frac{d^{100}}{dx^{100}}(\sin x) = \sin x$ $\frac{d^{100}}{dx^{100}}(\cos x) = \cos x$

(d) $\frac{d^{123}}{dx^{123}}(\sin x) = -\cos x$ $\frac{d^{123}}{dx^{123}}(\cos x) = \sin x$