Corrections

(#11) $\lim_{x \to \pi} f(x)$ where $f(x) = \begin{cases} \tan(x) - 3\cos(x) & \text{if } x < \pi \\ \dfrac{6}{\sin(x)+2} & \text{if } x \geq \pi \end{cases}$

$$\lim_{x \to \pi^-} f(x) \overset{\text{top}}{=} \lim_{x \to \pi^-} (\tan(x) - 3\cos(x))$$

$$= \tan(\pi) - 3(\cos(\pi))$$

$$= 0 - 3(-1)$$

$$= 3$$

$$\lim_{x \to \pi^+} f(x) \overset{\text{bottom}}{=} \lim_{x \to \pi^+} \left(\frac{6}{\sin(x)+2}\right)$$

$$= \frac{6}{\sin(\pi)+2}$$

$$= \frac{6}{2}$$

$$= 3$$

$$\boxed{\therefore \lim_{x \to 3} f(x) = 3}$$

(#16) $f(x) = \begin{cases} -\cos(x) & x \leq \pi \\ x & x > \pi \end{cases}$

potential discontinuity at $x = \pi$

(i) $f(\pi) \overset{\text{top}}{=} -\cos(\pi) = -(-1) = 1$

(ii) $\lim_{x \to \pi} f(x)$

(a) $\lim_{x \to \pi^-} f(x) = \lim_{x \to \pi^-} (-\cos(x)) = -\cos(\pi) = -(-1) = 1$

(b) $\lim_{x \to \pi^+} f(x) = \lim_{x \to \pi^+} (x) = \pi$

$\therefore \lim_{x \to \pi} f(x)$ D.N.E. since the left- and right-hand limits do not equal

$\boxed{\therefore \text{DISCONTINUITY AT } x = \pi}$