HW 2.2 p. 76 # 1, 2, 4, 5, 13, 16, 21, 24, 27, 29, 31

Sunday, September 14, 2014 4:03 PM

1. $f(x) = \cos\left(\frac{1}{x}\right)$

a) $\lim_{x\to\infty} f(x) = 1$

b) $\lim_{x\to-\infty} f(x) = 1$

c) HA $y = 1$

2. $f(x) = \frac{\sin 2x}{x}$

a) $\lim_{x\to\infty} f(x) = 0$

b) $\lim_{x\to-\infty} f(x) = 0$

c) HA $y = 0$

4. $f(x) = \frac{3x^3 - x + 1}{x+3}$

a) $\lim_{x\to\infty} f(x) = \infty$

b) $\lim_{x\to\infty} f(x) = \infty$

c) none

5. $f(x) = \frac{3x+1}{|x|+2}$

a) $\lim_{x\to\infty} f(x) = 3$

b) $\lim_{x\to-\infty} f(x) = -3$

c) HA @ $y = 3, y = -3$

13. $\lim_{x\to 2^+} \frac{1}{x-2} = \infty$

16. $\lim_{x\to -3^+} \frac{x}{x+3} = -\infty$

21. $y = \left(2 - \frac{x}{x+1}\right)\left(\frac{x^2}{5+x^2}\right)$

$\lim_{x\to\infty} y = \left[\lim_{x\to\infty} 2 - \lim_{x\to\infty} \frac{x}{x+1}\right]\left[\lim_{x\to\infty} \frac{x^2}{5+x^2}\right]$

$= [2 - 1][1] = \boxed{1}$

$\lim_{x\to-\infty} y$ = same = $\boxed{1}$

24. $y = \frac{2x + \sin x}{x}$

$\lim_{x\to\infty} y = \lim_{x\to\infty} \frac{2x}{x} + \lim_{x\to\infty} \frac{\sin x}{x}$

$= 2 + 0 = \boxed{2}$

$\lim_{x\to-\infty} y$ = same = $\boxed{2}$

27. $f(x) = \frac{1}{x^2-4} = \frac{1}{(x+2)(x-2)}$

a) V.A. $x = -2$, $x = 2$

b) $\lim_{x\to-2^-} f(x) = \infty$ $\lim_{x\to-2^+} f(x) = -\infty$

$\lim_{x\to 2^-} f(x) = -\infty$ $\lim_{x\to 2^+} f(x) = \infty$

29. $f(x) = \frac{x^2 - 2x}{x+1} = \frac{x(x-2)}{x+1}$

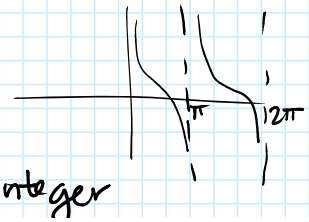
a) V.A. $x = -1$

b) $\lim_{x\to-1^-} f(x) = -\infty$ $\lim_{x\to-1^+} f(x) = \infty$

31. $f(x) = \cot(x)$

a) V.A. $x = k\pi$,

k is any integer



k is any integer

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