121 HW #6

Section 3.1 # 48, 50

Section 3.2 # 10

Section 3.3 # 1, 2

3.1 # 48 $\lim_{x\to\infty} \frac{2x^2-1}{3x^4+2} = 0$ (bottom has bigger degree)

3.1 # 50 $\lim_{x\to\infty} \frac{x^4-x^3-3x}{7x^2+9}$ DNE (top has bigger degree)

3.2 # 10 $f(x) = \frac{x^2-25}{x+5}$ $x+5=0$, $x=-5$

It's discontinuous at $x=-5$, and

$$\lim_{x\to-5} \frac{x^2-25}{x+5} = \lim_{x\to-5} \frac{(x-5)(x+5)}{x+5} = \lim_{x\to-5} x-5 = -5-5 = -10$$

3.3 # 1 Avg rate of change for $y = x^2+2x$ between $x=1$, $x=3$

$$\frac{f(3)-f(1)}{3-1} = \frac{3^2+2\cdot3-(1^2+2\cdot1)}{3-1} = \frac{9+6-(3)}{2}$$

$$= \frac{12}{2} = 6$$

3.3 # 2 Avg rate of change for $y = -4x^2-6$ between $x=2$, $x=6$

$$\frac{f(6)-f(2)}{6-2} = \frac{-4\cdot6^2-6-(-4\cdot2^2-6)}{6-2} = \frac{-144-6+16+6}{4} = -32$$