Worksheet 01/15/2019   - MAC 2311

1. Find the following limits, provided they exist.

(a) $\lim\limits_{x \to 3+} \dfrac{2}{3-x}$

(b) $\lim\limits_{x \to 3-} \dfrac{2}{3-x}$

(c) $\lim\limits_{x \to 3} \dfrac{2}{3-x}$

(d) $\lim\limits_{x \to 0} \dfrac{3x-x^2}{x^2-4x+3}$

(e) $\lim\limits_{x \to 3} \dfrac{3x-x^2}{x^2-4x+3}$

(f) $\lim\limits_{x \to 1} \dfrac{3x-x^2}{x^2-4x+3}$

(g) $\lim\limits_{x \to 2} \dfrac{x^2+x-6}{2-x}$

(h) $\lim\limits_{x \to 2} \dfrac{x^2+x-6}{|2-x|}$

2. Find the following limits, provided they exist:

(a) $\lim\limits_{x \to -1} \dfrac{\sqrt{x^2+8}-3}{x+1}$

(b) $\lim\limits_{x \to 2} \dfrac{8-x^3}{x^3-5x+2}$

3. Compute each of the following limits:

(a) $\lim\limits_{x\to 0} \dfrac{\sin(5x)}{x} =$

$\lim\limits_{x\to 0} \dfrac{\sin(ax)}{x} =$

(b) $\lim\limits_{x\to 0} \dfrac{\tan(3x)}{x} =$

$\lim\limits_{x\to 0} \dfrac{\tan(bx)}{x} =$

(c) $\lim\limits_{x\to 0} \dfrac{1-\cos(x)}{x}$

(d) $\lim\limits_{x\to 0} \dfrac{\tan^2(3x)}{x\sin(5x)}$

(e) $\lim\limits_{x\to 0} \dfrac{\sin(3x^2)+x^2}{\sin^2(3x)}$

(f) $\lim\limits_{x\to +\infty} x\tan(3/x)$ Hint: Use the substitution technique.

(g) $\lim\limits_{x\to +\infty} \dfrac{\sin(5x)}{x}$ Hint: Be careful! Here x does not go to zero!