

MATH 1710.200 - Homework 2

Due: 9/14/16

1. Find the limit (if it exists). Use the symbols ∞ or $-\infty$ if appropriate.

$$\lim_{x \rightarrow -2} \frac{3(2x+1)^2 - 27}{x+2}$$

2. Evaluate the following limits (if they exist). Use the symbols ∞ or $-\infty$ if appropriate.

(a) $\lim_{x \rightarrow \infty} \frac{1-x}{2x}$

(b) $\lim_{x \rightarrow \infty} \frac{1-x}{x^2}$

(c) $\lim_{x \rightarrow \infty} \frac{1-x^2}{2x}$

3. Find the following limits (if they exist).

(a) $\lim_{x \rightarrow 1} \left(\frac{1}{1-x} - \frac{2}{1-x^2} \right)$

(b) $\lim_{x \rightarrow \pi/3} \frac{2\cos^2 x + 3\cos x - 2}{2\cos x - 1}$

4. Because of their connection with rates of change, limits of the form $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ occur frequently in calculus. Evaluate this limit for $f(x) = x^2$ and $x = -2$.

5. Suppose that $\lim_{x \rightarrow 3} xf(x) = 12$. Show that $\lim_{x \rightarrow 3} f(x)$ exists and find its value.

6. Suppose $\lim_{x \rightarrow a} (f(x) + g(x)) = 3$ and $\lim_{x \rightarrow a} (f(x) - g(x)) = 1$ then find $\lim_{x \rightarrow a} f(x)g(x)$

7. Textbook 2.4 number 44