

## Math 131 - January 29, 2015

### Warm-up Problems

1. Rationalize the denominator (get the square root out of the denominator using algebra):

(a)  $\frac{1}{\sqrt{2}} =$

(b)  $\frac{1}{1-\sqrt{3}} =$

(c)  $\frac{1}{\sqrt{2}+\sqrt{5}} =$

### Lecture Problems

2. Compute the limits by plugging in. If that fails, try manipulating algebraically. If that fails, try making a table of values.

(a)  $\lim_{x \rightarrow 5} x^3 - 2x + 1 =$

(b)  $\lim_{x \rightarrow 3} \sin x =$

(c)  $\lim_{x \rightarrow 2} \frac{x^2 - 2x + 7}{x^2 + 1} =$

(d)  $\lim_{x \rightarrow 5} \frac{x^2 - 6x + 5}{x - 5} =$

(e)  $\lim_{x \rightarrow -2} \frac{x + 2}{x^3 + 8} =$

(f)  $\lim_{x \rightarrow 3} \frac{\frac{1}{x} - \frac{1}{3}}{x - 3} =$

(g)  $\lim_{x \rightarrow 16} \frac{4 - \sqrt{x}}{16x - x^2} =$

(h)  $\lim_{x \rightarrow 1} \frac{x - 1}{\ln x} =$

(i)  $\lim_{x \rightarrow 0} \frac{x}{e^x - 1} =$

3. Given the following:

$$\lim_{x \rightarrow 2} f(x) = 4 \quad \lim_{x \rightarrow 2} g(x) = 2 \quad \lim_{x \rightarrow 2} h(x) = 0$$

Find the following:

(a)  $\lim_{x \rightarrow 2} f(x) - 3g(x) =$

(b)  $\lim_{x \rightarrow 2} \frac{(f(x))^3 + 1}{g(x) + 3h(x)} =$

(c)  $\lim_{x \rightarrow 2} \frac{f(x) - 2g(x)}{h(x)} =$

(d)  $\lim_{x \rightarrow 2} \frac{f(x) - g(x)}{h(x)} =$

(e)  $\lim_{x \rightarrow 2} \frac{h(x)}{f(x) - g(x)} =$

(f)  $\lim_{x \rightarrow 2} \sqrt{8f(x) - g^2(x)} =$