

1. Compute each of the following limits.

a.  $\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x^2 - 3x + 2}$

b.  $\lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x^2 - 4}$

c.  $\lim_{h \rightarrow 0} \frac{(5 + 2h)^2 - 25}{h}$

d.  $\lim_{t \rightarrow 0} \left( \frac{2}{t} + \frac{7t - 4}{2t} \right)$

e.  $\lim_{h \rightarrow 0} \frac{(x + h)^2 - x^2}{h}$

f.  $\lim_{x \rightarrow 0} \frac{x^2 - 3x}{x^2 - 6x}$

g.  $\lim_{x \rightarrow 5} \frac{x^2 + 1}{x - 5}$

h.  $\lim_{x \rightarrow 0^+} \frac{27x}{\sqrt{x}}$

2. Refer to Recitation Worksheet 3A problem 2.

a. Is  $f(x)$  continuous at  $x = 1$ ?

b. Is  $f(x)$  continuous at  $x = 2$ ?

3. Refer to Recitation Worksheet 3A problem 3. Is  $y = |x|$  continuous at  $x = 0$ ?

4. Let  $g(x) = \begin{cases} x - 1 & x < 2 \\ x^2 - A^2 & x \geq 2 \end{cases}$

a. Sketch the graph of  $y = g(x)$  using  $A = 0$ . Is  $g(x)$  continuous?

b. Sketch the graph of  $y = g(x)$  using  $A = 1$ . Is  $g(x)$  continuous?

c. Sketch the graph of  $y = g(x)$  using  $A = 2$ . Is  $g(x)$  continuous?

d. Do you think there is a real value of  $A$  which makes  $g(x)$  continuous?

If so, what is  $A$ ? If not, why not?