

Math 131 Week in Review
Sections 2.1, 2.2, 2.3
2/7/10

1. The point $P(1, 1)$ lies on the curve $y = \dfrac{2}{x+1}$.

   a. If Q is the point $\left(x, \dfrac{2}{x+1}\right)$, find the slope of the secant line PQ (correct to four decimal places) for the following values of x:

      0.5

      0.9

      0.99

      0.999

      1.001

      1.01

      1.1

      1.5

   b. Using the results of part a, estimate the value of the slope of the tangent line to the curve at $P(1, 1)$.

   c. Using the slope from part b, find an equation of the tangent line to the curve at $P(1, 1)$.

2. Sketch the graph of an example of a function g that satisfies all of the given conditions.

   $\lim\limits_{x\to 2-} g(x) = 4$ $\lim\limits_{x\to 2+} g(x) = 4$ $g(2) = 0$

3. Find the following limits:

a. $\lim_{x\to -2} 3x^3 - x^2 + 5$

b. $\lim_{x\to 1} \dfrac{x^3 - x^2 + 3x - 3}{x - 1}$

c. $\lim_{x\to 3} \dfrac{x-3}{x+3}$

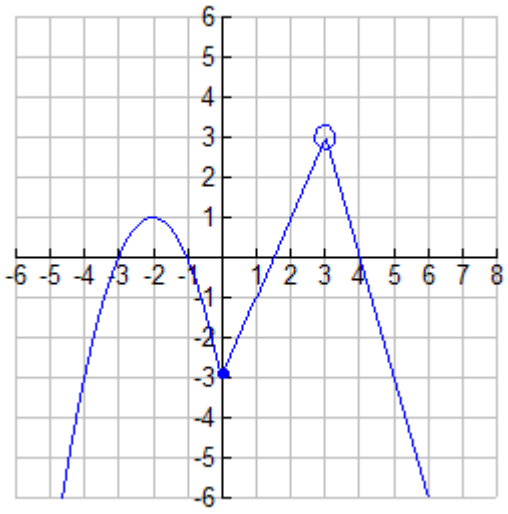
d. $\lim_{x\to 3} \dfrac{x^3 - 2}{x - 3}$

e. $\lim_{x\to 0} \dfrac{9 - (x-3)^2}{x}$

f. $\lim_{x\to 0} \dfrac{\sqrt{x-3} + 2}{x}$

g. $\lim_{x\to 0} \dfrac{\dfrac{1}{x+2} - \dfrac{2}{x}}{x}$

4. Use the graph of $g(x)$ below to find the indicated limits and function values.



a. $\lim_{x\to -2} g(x)$

b. $\lim_{x\to 0-} g(x)$

c. $\lim_{x\to 0+} g(x)$

d. $\lim_{x\to 0} g(x)$

e. $g(0)$

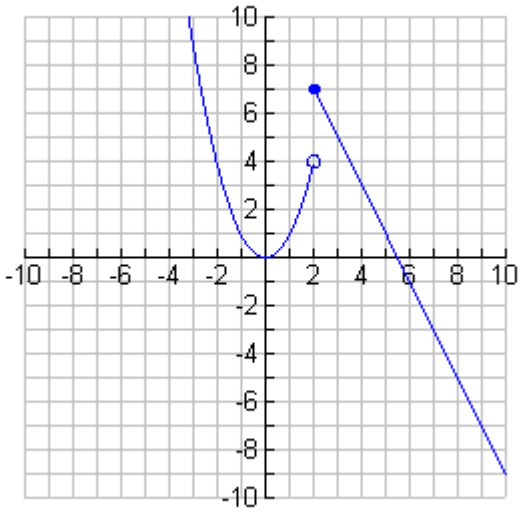
f. $\lim_{x\to 3-} g(x)$

g. $\lim_{x\to 3+} g(x)$

h. $\lim_{x\to 3} g(x)$

i. $g(3)$

5. Use the graph of h below to find the indicated limits and function values.



a. $\lim_{x\to 3-} h(x)$

b. $\lim_{x\to 3+} h(x)$

c. $\lim_{x\to 3} h(x)$

d. $h(3)$

e. $\lim_{x\to 2-} h(x)$

f. $\lim_{x\to 2+} h(x)$

g. $\lim_{x\to 2} h(x)$

h. $h(2)$

6. For the function defined below, evaluate the limits and function values indicated.

$$F(x)=\begin{cases} x^2 & for\ x\le 3 \\ -x-3 & for\ 3<x\le 4 \\ x-11 & for\ 4<x\le 6 \\ -x & for\ x>6 \end{cases}$$

a. $\lim_{x\to 3-} F(x)$

b. $\lim_{x\to 3+} F(x)$

c. $\lim_{x\to 3} F(x)$

d. F(3)

e. $\lim_{x\to 4-} F(x)$

f. $\lim_{x\to 4+} F(x)$

g. $\lim_{x\to 4} F(x)$

h. $F(4)$

i. $F(6)$