

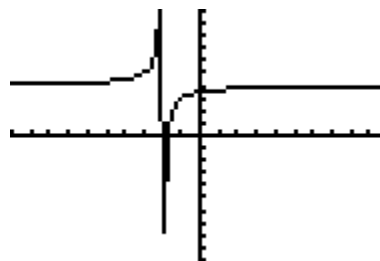
Review for Test 1

For full credit circle answers and **show all your work**. Each problem is worth lotso points.

1) In your own words, what is calculus?

2) Suppose you were asked to:
 “Find the distance traveled in 15 sec.
 by an object traveling at a velocity
 $v(t) = 20 + 7 \cos t$ ft/sec.”
 Would this be a calculus problem? Why?

3) Find the limit of the picture on a standard window as x approaches infinity.



4) Find the limit:

$$\lim_{x \rightarrow 3} \frac{x+3}{x^2-9}$$

5) Find the limit:

$$\lim_{x \rightarrow -8} \frac{\sqrt{1-x}-3}{x+8}$$

6) Find the limit and a simpler function that agrees with the given function at all but one point.

$$\lim_{x \rightarrow 0} \frac{-2x + x^2}{x-2}$$

7) Identify all discontinuities and tell which are removable and which are not removable.

$$f(x) = \frac{x}{x^2 + x}$$

8) Find the limit:

$$\lim_{\Delta x \rightarrow 0} \frac{\frac{1}{x+\Delta x} - \frac{1}{x}}{\Delta x}$$

9) Find the limit:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x}$$

10) Find the limit:

$$\lim_{x \rightarrow \frac{\pi}{2}} \sin x$$

11) Find the derivative using the limit process of $f(x) = x^3 - x^2$.

12) Find the derivative using the limit process of $f(x) = 5x - 24$.

13) Find the equation of a tangent line to

$$f(x) = 3x^2 - x \text{ at } x = 4.$$

14) Find the limit:

$$\lim_{h \rightarrow 0} \frac{\frac{1}{x+h} - \frac{1}{x}}{h}.$$

15) Find the derivative of:

$$f(t) = t^2 \sin t.$$

16) Find $f'(x)$ when:

$$f(x) = \frac{\sqrt[3]{x}}{x^3 + 1}.$$

17) Find the derivative of:

$$f(x) = (9x + 2)^{\frac{2}{3}}$$

18) Find dy/dx of:

$$8 = x^3 + y^3.$$

19) Find the derivative of:

$$y = \frac{\sin x}{x}$$

20) Find the derivative of:

$$y = \frac{\sin x}{\cos xy}$$