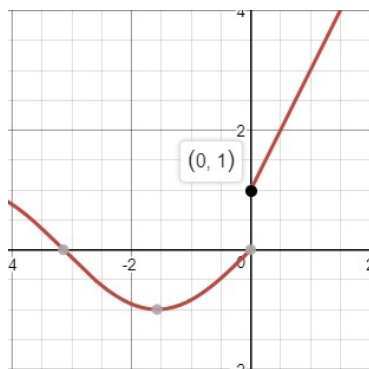


# Lesson 3 Worksheet

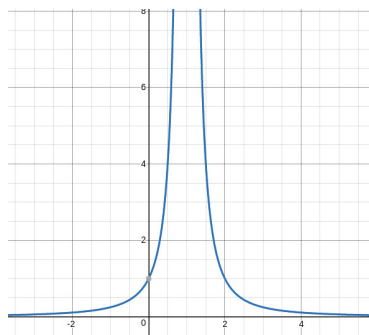
January 12, 2018

1.  $f(x) = \begin{cases} \sin x & \text{if } x < 0 \\ 2x + 1 & \text{if } x \geq 0 \end{cases}$



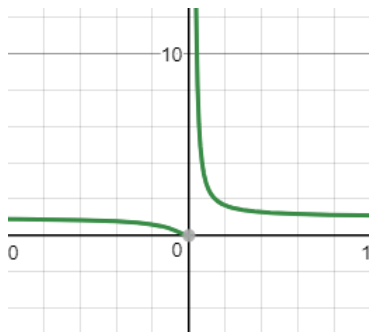
- $\lim_{x \rightarrow 0^-} f(x) =$
- $\lim_{x \rightarrow 0^+} f(x) =$
- $\lim_{x \rightarrow 0} f(x) =$
- $f(0) =$

2.  $f(x) = \frac{1}{x-1}$



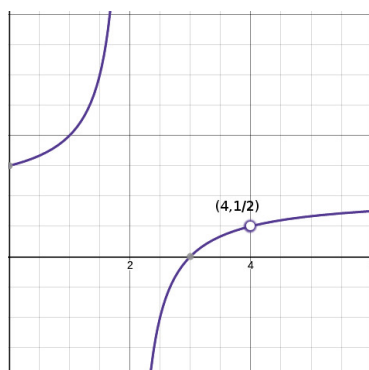
- $\lim_{x \rightarrow 1^-} f(x) =$
- $\lim_{x \rightarrow 1^+} f(x) =$
- $\lim_{x \rightarrow 1} f(x) =$
- $f(1) =$

3.  $f(x) = e^{1/x}$



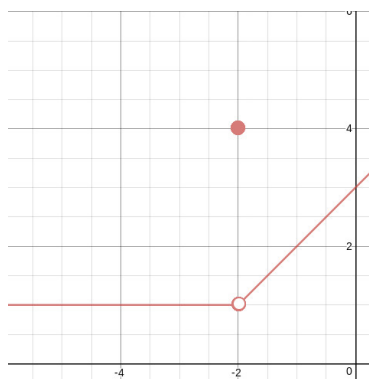
- $\lim_{x \rightarrow 0^-} f(x) =$
- $\lim_{x \rightarrow 0^+} f(x) =$
- $\lim_{x \rightarrow 0} f(x) =$
- $f(0) =$

4.  $f(x) = \frac{(x-3)(x-4)}{(x-2)(x-4)}$



- $\lim_{x \rightarrow 2^-} f(x) =$
- $\lim_{x \rightarrow 2^+} f(x) =$
- $\lim_{x \rightarrow 2} f(x) =$
- $f(2) =$
- $\lim_{x \rightarrow 4^-} f(x) =$
- $\lim_{x \rightarrow 4^+} f(x) =$
- $\lim_{x \rightarrow 4} f(x) =$
- $f(4) =$

5.  $f(x) = \begin{cases} 1 & \text{if } x < -2 \\ 4 & \text{if } x = -2 \\ x + 3 & \text{if } x > -2 \end{cases}$



a.  $\lim_{x \rightarrow -2^-} f(x) =$

b.  $\lim_{x \rightarrow -2^+} f(x) =$

c.  $\lim_{x \rightarrow -2} f(x) =$

d.  $f(-2) =$

6. If  $\sec \theta = -13/5$  and  $\tan \theta$  is positive, find:

a.  $\sin \theta =$

b.  $\cos \theta =$

c.  $\tan \theta =$

d.  $\csc \theta =$

e.  $\cot \theta =$

7. Find all solutions of  $6 \cos(3x) + 3 = 0$  on the interval  $(0, \pi)$ .

8. Rewrite the following in terms of only  $\cos(x)$  and  $\sin(x)$ :

(a)  $\sec(x) \tan(x)$

(b)  $\sec(x) \csc(x)$

(c)  $\sec(x) \cot(x)$

(d)  $\sec^2(x)$

9. Give the exact value of each of the following:

(a)  $\sin(\frac{\pi}{3})$

(b)  $\sec(\frac{3\pi}{4})$

Answers:

1. a. 0  
b. 1  
c. DNE  
d. 1
2. a.  $\infty$   
b.  $\infty$   
c.  $\infty$   
d. undefined
3. a. 0  
b.  $\infty$   
c. DNE  
d. undefined
4. a.  $\infty$   
b.  $-\infty$   
c. DNE  
d. undefined  
e.  $1/2$   
f.  $1/2$   
g.  $1/2$   
h. undefined
5. a. 1  
b. 1  
c. 1  
d. 4
6. a.  $-12/13$   
b.  $-5/13$   
c.  $12/5$   
d.  $-13/12$   
e.  $5/12$
7.  $2\pi/9, 4\pi/9, 7\pi/9, 8\pi/9$
8. a.  $\frac{\sin(x)}{\cos^2(x)}$   
b.  $\frac{1}{\sin(x) \cos(x)}$   
c.  $\frac{1}{\sin(x)}$   
d.  $\frac{1}{\cos^2(x)}$
9. (a)  $\frac{\sqrt{3}}{2}$   
(b)  $-\sqrt{2}$