

Find the exact value of each of the following. You may NOT use a calculator.

1.  $\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

2.  $\csc \frac{\pi}{6} = 2$

3.  $\cot \frac{\pi}{6} = \sqrt{3}$

4.  $\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

5.  $\cos \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

6.  $\tan \frac{\pi}{4} = 1$

7.  $\sin \frac{5\pi}{6} = \frac{1}{2}$

8.  $\sec \frac{5\pi}{6} = -\frac{2\sqrt{3}}{3}$

9.  $\tan \frac{5\pi}{6} = -\frac{\sqrt{3}}{3}$

10.  $\sin \pi = 0$

11.  $\cos \pi = -1$

12.  $\tan \pi = 0$

13.  $\sin \frac{3\pi}{2} = -1$

14.  $\cos \frac{3\pi}{2} = 0$

15.  $\tan \frac{3\pi}{2} = \text{undefined}$

16.  $\sin 2\pi = 0$

17.  $\cos 2\pi = 1$

18.  $\tan 2\pi = 0$

19. Describe how the values of a, b, c, and d would affect the parents graphs.

$$y = \pm a(\pm b(x \pm c))^3 \pm d$$

$$y = \pm a\sqrt{\pm b(x \pm c)} \pm d$$

$$y = \frac{\pm a}{\pm b(x \pm c)} \pm d$$

$$y = \pm a \sin(\pm b(x \pm c)) \pm d$$

Fill in the missing information for the following functions. (without a calculator)

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

21)  $f(x) = \frac{x + 4}{x^2 + 7x + 12}$

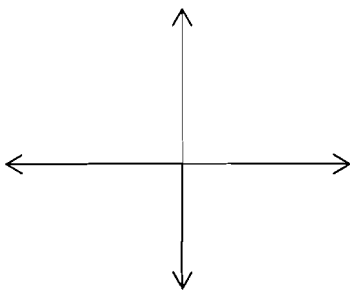
22)  $g(x) = -\sqrt{-(x - 6)}$

Transformations:

Hole:

VA:

HA:



Domain:

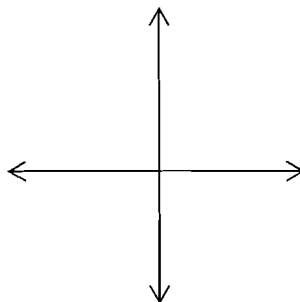
Range:

Transformations:

Hole:

VA:

HA:



Domain:

Range:

Transformations:

Domain:

Range:

1. Describe how the values of a, b, c, and d would affect the parents graphs.

$$y = \pm a(\pm b(x \pm c))^3 \pm d$$

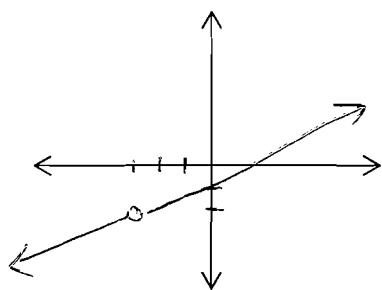
$$y = \pm a\sqrt{\pm b(x \pm c)} \pm d$$

$$y = \frac{\pm a}{\pm b(x \pm c)} \pm d$$

$y = \pm a \sin(\pm b(x \pm c)) \pm d$  if  $|a| > 1$  then vertical stretch if  $|b| > 1$  horizontal shrink  
 if  $|a| < 1$  then vertical shrink if  $|b| < 1$  horizontal stretch  
 c moves the graph left or right  
 d moves the graph up or down

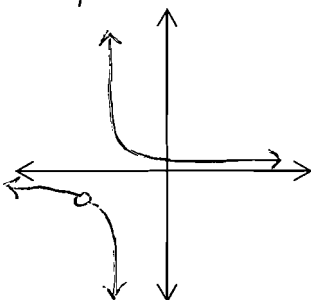
Fill in the missing information for the following functions. (without a calculator)

2)  $f(x) = \frac{x^2 - 9}{3x + 9} \frac{(x+3)(x-3)}{3(x+3)}$   
 down vertical shrink by  $\frac{1}{3}$   
 Transformations:  $\frac{1}{3}x - 1$   
 Hole:  $(-3, -2)$   
 VA: None  
 HA: None



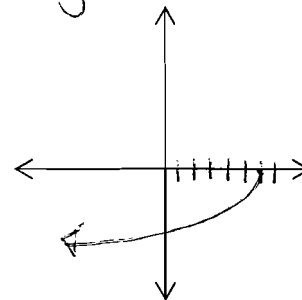
Domain:  $(-\infty, -3) \cup (-3, \infty)$   
 Range:  $(-\infty, -2) \cup (-2, \infty)$

3)  $f(x) = \frac{x+4}{x^2+7x+12} \frac{(x+4)}{(x+4)(x+3)}$   
 Transformations: left + 3  $\frac{1}{x+3}$   
 Hole:  $(-4, -1)$   
 VA:  $x = -3$   
 HA:  $y = 0$



Domain:  $(-\infty, -4) \cup (-4, -3) \cup (-3, \infty)$   
 Range:  $(-\infty, -1) \cup (-1, 0) \cup (0, \infty)$

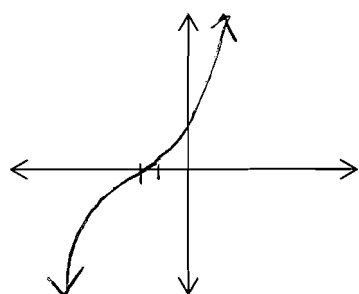
4)  $g(x) = -\sqrt{-(x-6)}$   
 Transformations:  
 reflect x-axis  
 reflect y-axis  
 right 6



Domain:  $(-\infty, 6]$   
 Range:  $(-\infty, 0]$

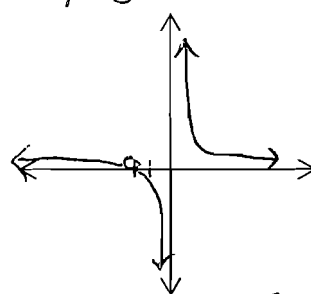
Fill in the missing information for the following functions. (with/without a calculator)

5)  $h(x) = \left(\frac{1}{2}(x+2)\right)^3$   
 Transformations:  
 Vertical shrink by  $\frac{1}{2}$   
 left + 2



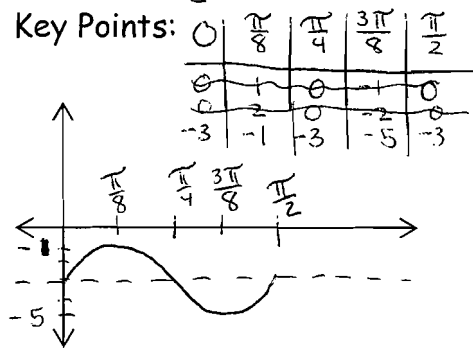
Domain:  $(-\infty, \infty)$   
 Range:  $(-\infty, \infty)$

6)  $f(x) = \frac{x^2+x-2}{5x^2+10x} \frac{(x+2)(x-1)}{5x(x+2)}$   
 Hole:  $(-2, \frac{3}{10})$   
 VA:  $x = 0$   
 HA:  $y = \frac{1}{5}$



Domain:  $(-\infty, -2) \cup (-2, 0) \cup (0, \infty)$   
 Range:  $(-\infty, \frac{1}{5}) \cup (\frac{1}{5}, \frac{3}{10}) \cup (\frac{3}{10}, \infty)$

7)  $g(x) = 2\sin(4x) - 3$   
 vertical stretch by 2  
 Transformations: horizontal Shrink by 4  
 Amp: 2  
 Period:  $\frac{2\pi}{4} = \frac{\pi}{2}$  down 3

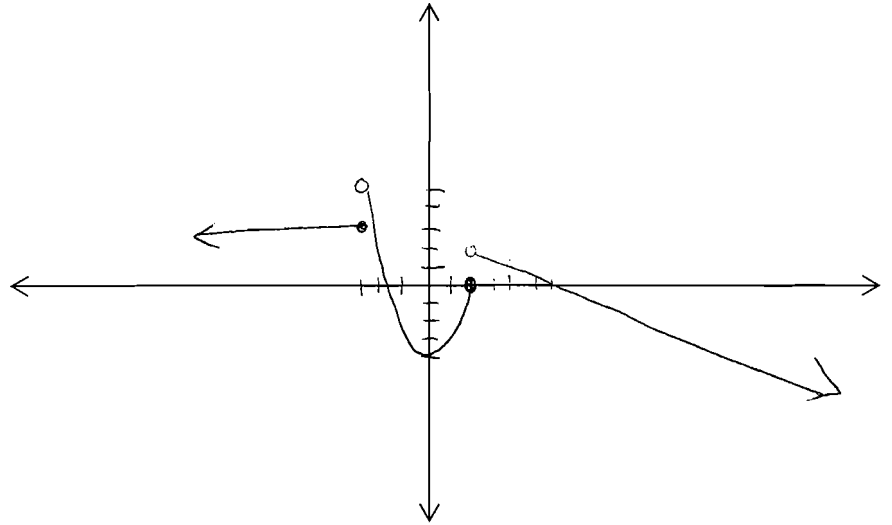


Domain:  $(-\infty, \infty)$   
 Range:  $[-5, -1]$

Plot the graphs of the given piecewise functions and calculate the requested function values.

(without a calculator)

$$8) g(x) = \begin{cases} 3 & \text{if } x \leq -3 \\ x^2 - 4 & \text{if } -3 < x \leq 2 \\ -\frac{1}{2}x + 3 & \text{if } x > 2 \end{cases}$$



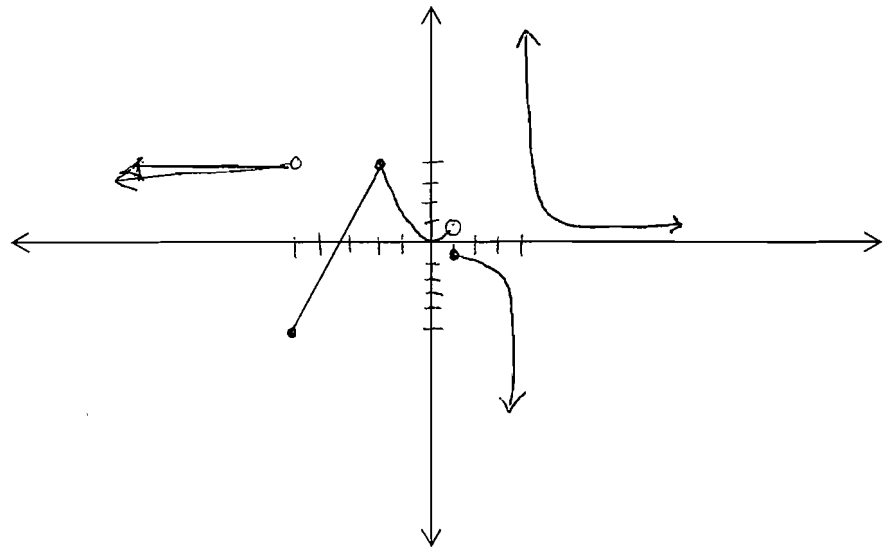
$$g(0) = -4 \quad g(-3) = 3$$

$$g(2) = 0 \quad g(-5) = 3$$

$$g(3) = \frac{3}{2} \text{ or } 1.5 \quad g(-7.273) = 3$$

(with/without a calculator)

$$9) h(x) = \begin{cases} 4 & \text{if } x < -5 \\ 3x + 10 & \text{if } -5 \leq x \leq -2 \\ x^2 & \text{if } -2 < x < 1 \\ \frac{1}{x-4} & \text{if } x \geq 1 \end{cases}$$



$$f(5) = 1 \quad f(-2) = 4$$

$$f(2) = \frac{-1}{2} \quad f(-4) = -2$$

$$f(6) = \frac{1}{2} \quad f(1) = -\frac{1}{3}$$

$$f(-8) = 4 \quad f(0) = 0$$