1. Solve the inequality and write the answer in interval notation.

a. $2x - 1 \geq 0$

b. $-4 \leq 2x - 3 < 4$

c. $\frac{x}{2} - \frac{x}{3} > 5$

d. $5(x - 3) \leq 8(x + 5)$

e. $4 - \frac{5x}{3} > -(2x + \frac{1}{2})$

f. $\frac{3}{4} > x + 1 > \frac{1}{2}$

g. $x + 7 \geq |5 - 3x|$

h. $(x + 2)^2 < 25$

i. $\frac{x-7}{x-1} < 0$

j. $\frac{x+6}{x^2-5x-24} \geq 0$

2. Find the domain of the following functions.
   a. $y = \frac{x-4}{x^2-16}$
   b. $y = \sqrt{2x-9}$
   c. $y = \log(x-10)$
   d. $y = \frac{\sqrt{2x+14}}{x^2-49}$

3. Simplify each of the following:
   a. $\log_2 5 + \log_2(x^2-1) - \log_2(x-1)$
   b. $3^{2\log_3 5}$

4. Solve the following equations for x:
   a. $5^{(x+1)} = 25$
   b. $\frac{1}{3} = 3^{2x+2}$
   c. $\log_2 x^2 = 3$

d. $\log_3 x^2 = 2\log_3 4 - 4\log_3 5$

h. $3^{x-2} = 18$

e. $\log_2(x-1) + \log_2(x+3) = 5$

i. $e^{3x+1} = 10$

f. $\log_5(x+3) - \log_5 x = 2$

j. $8^x = 5^{2x-1}$

g. $\ln x^3 - \ln x^2 = \frac{1}{2}$

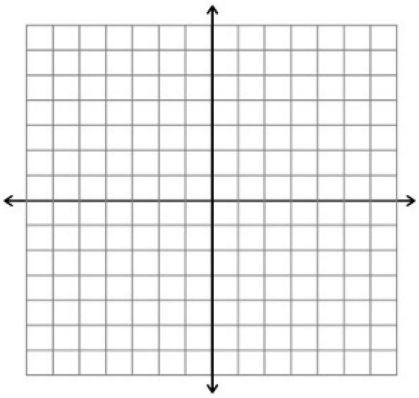
5. For the given functions find the compositions, $f \circ g$ and $g \circ f$.

$f(x) = 9 - x$

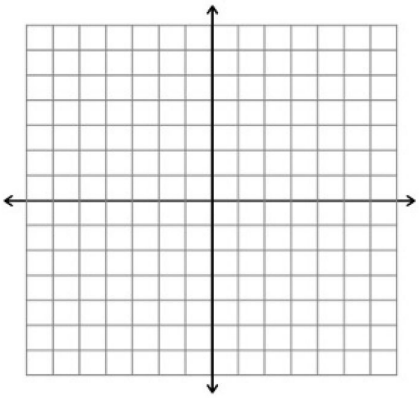
$g(x) = x^2 + 2$

6. Graph the following functions. The graphs must have at least two points labeled with coordinate.

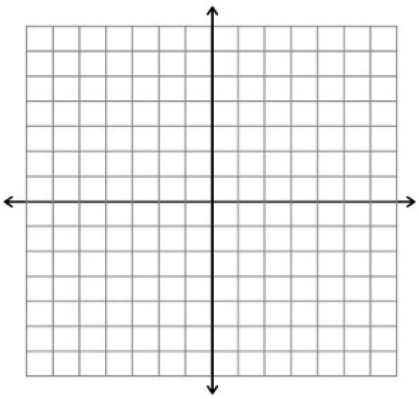
a. $y = -x^2$



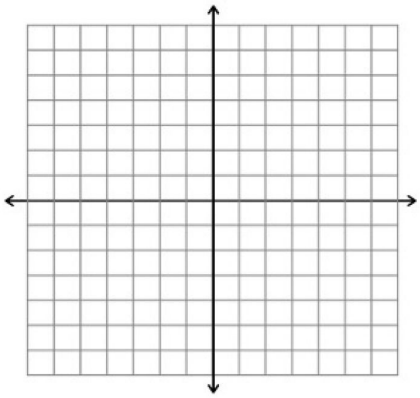
b. $y = (x - 2)^2$



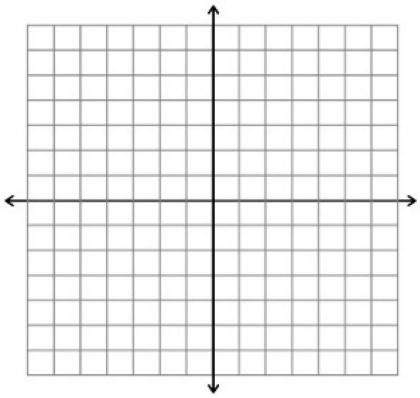
c. $y = 2 - \sqrt{x}$



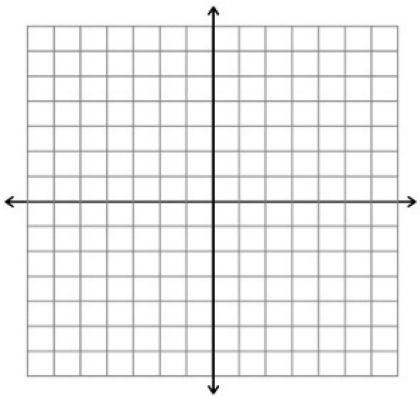
d. $y = |x + 1| - 3$



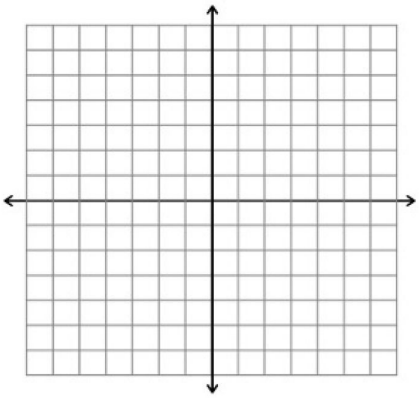
e. $y = \frac{1}{x-3}$



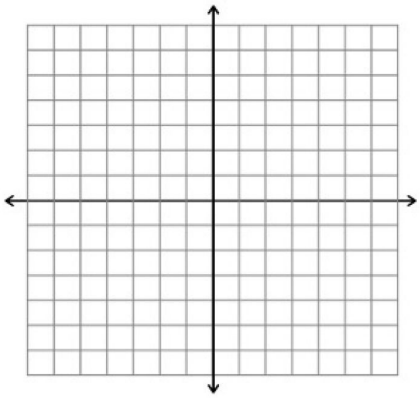
f. $y = |x + 4|$



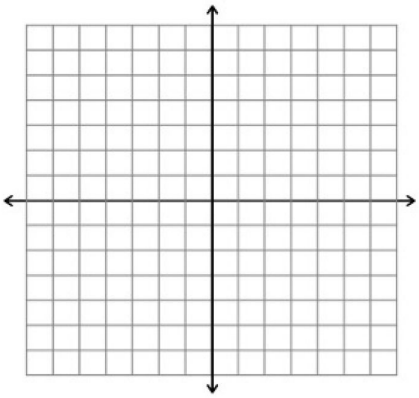
g. $y = 2^x - 2$



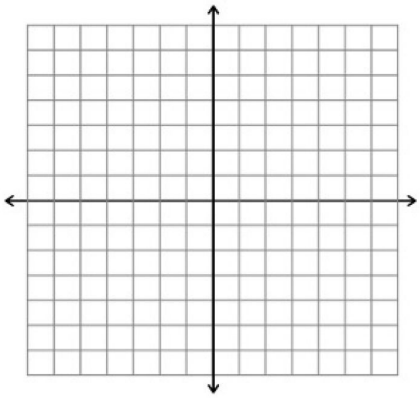
j. $y = \frac{x+3}{x^2-16}$



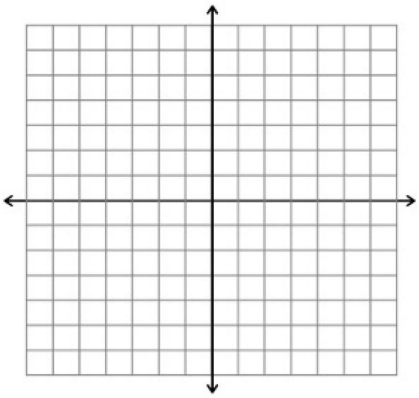
h. $y = e^x - 1$



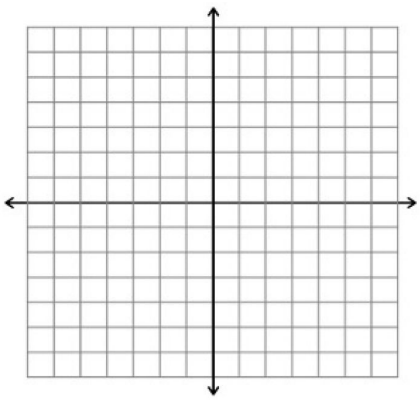
k. $y = \log(x) + 4$



i. $y = \ln(x - 3)$

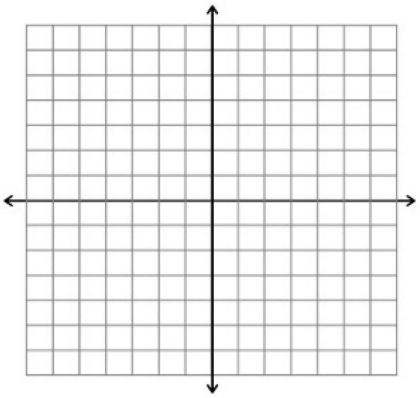


l. $y = 2x - 5$



7. Graph the following piecewise function

$$f(x) = \begin{cases} -2x - 1, & x \le 2 \\ -x + 4, & x > 2 \end{cases}$$



8. Sketch the following rational function. Identify point(s) of discontinuity, hole(s), vertical asymptote(s), and horizontal asymptote(s).

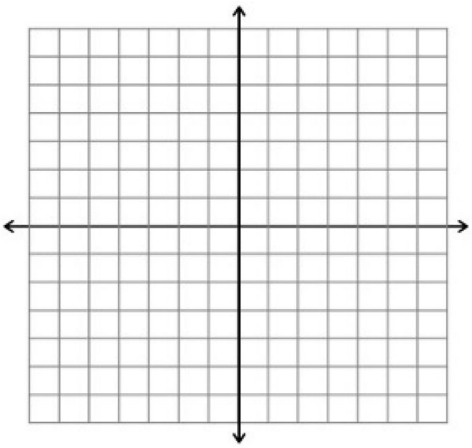
$f(x) = \frac{-x^2}{x^2-x-6}$

Point(s) of Discontinuity: _____

Hole(s): _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____



9. Find the exact value of the following:

a. $\cos 270^\circ$

b. $\sin \frac{7\pi}{4}$

c. $\tan 90^\circ$

d. $\sin \frac{\pi}{4}$

e. $\tan 120^\circ$

f. $\cos \frac{11\pi}{6}$

g. $\tan \frac{5\pi}{3}$

h. $\sin 210^\circ$

i. $\cos \frac{4\pi}{3}$

j. $\tan 0$

10. Find the exact value of the following:

a. $\sin^{-1} -\frac{1}{2}$

b. $\cos^{-1} \frac{1}{2}$

c. $\tan^{-1} \frac{\sqrt{3}}{3}$

d. $\sin^{-1} \frac{\sqrt{2}}{2}$

e. $\cos^{-1} \frac{\sqrt{3}}{2}$

f. $\sin^{-1} 0$

g. $\cos^{-1} 0$

h. $\tan^{-1} -\sqrt{3}$