Name: _____

College Algebra: Review (Test 2)

1. Find all solutions of the following inequality.

$$|4x + 1| + 12 \leq 25$$

2. Find all solutions of the following inequality.

$$2|3x - 9| + 14 < 23$$

3. Find all solutions of the following inequality.

$$2|4x + 3| + 10 > 17$$

4. Find the domain of the following function.

$$f(x) = \frac{6x^3 + x^2 + 4x + 8}{x^2 - x - 2}$$

5. Find the domain of the following function.

$$f(x) = \sqrt{6x + 3}$$

6. Find the domain of the following function.

$$f(x) = \sqrt{|1x + 1| - 2}$$

7. Evaluate the function

$$f(x) = 2x^3 + 5x + 3$$

at $x = 2$, $x = 0$, $x = -3$, and $x = 1/2$.

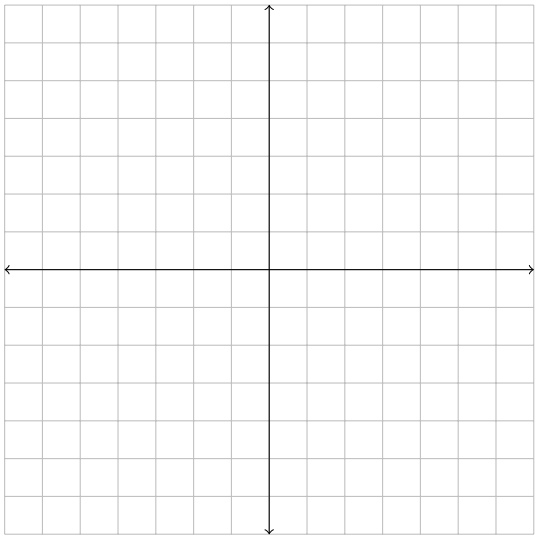
8. Evaluate the function

$$f(x) = \begin{cases} 6x - 5 & \text{if } x \geq 5 \\ \frac{1}{x^2 - 5} & \text{if } x < 5 \end{cases}$$

at $x = 1$, $x = 9$, and $x = -7$.

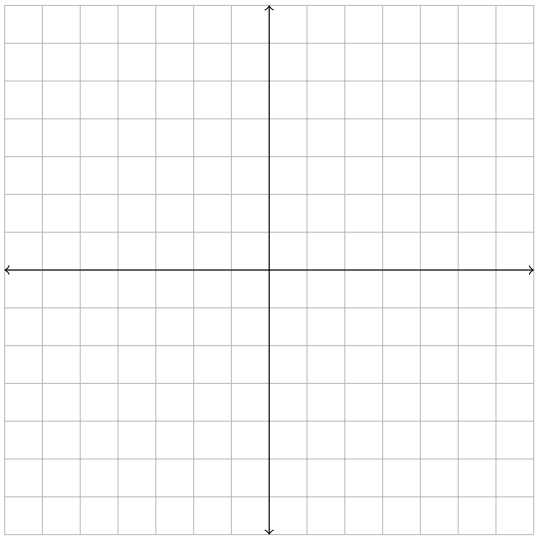
9. Sketch the graph of the following equation in the space provided.

$$(x - 4)^2 + (y + 1)^2 = 1$$



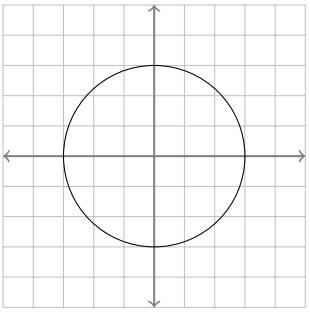
10. Sketch the graph of the following equation in the space provided.

$$\left(\frac{1}{2}(x-1)\right)^2 + (y-4)^2 = 4$$

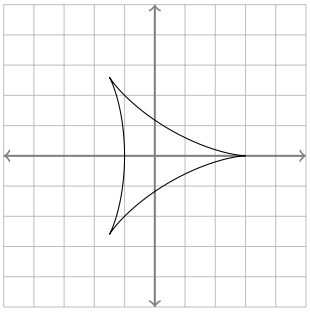


11. Graphically transform the following graph in the space provided.

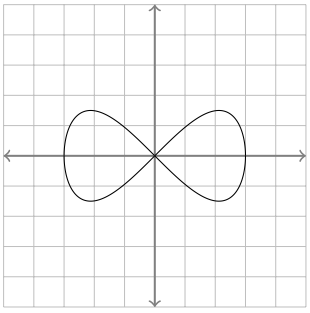
Shift left by 1 unit(s) and shift down by 1 unit(s).



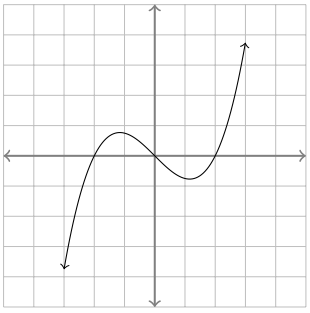
12. Determine whether or not the following graphs are symmetric across the x-axis, across the y-axis, or about the origin.



x-axis: yes/no
y-axis: yes/no
origin: yes/no



x-axis: yes/no
y-axis: yes/no
origin: yes/no



x-axis: yes/no
y-axis: yes/no
origin: yes/no

13. Determine whether or not the following equations are symmetric across the x-axis, across the y-axis, about the origin, or none of the three.

(a) $x^4 + y^4 = 1$

(b) $x^2 + xy + y^2 = 1$

(c) $\dfrac{1}{y^2} + xy - \dfrac{1}{x^2} = 1$

14. Let $f(x) = x^2 + 1$ and $g(x) = 3x - 2$. Find the following.

(a) $(f \circ g)(2)$

(b) $(g \circ f)(2)$

(c) $(f \circ g)(x)$