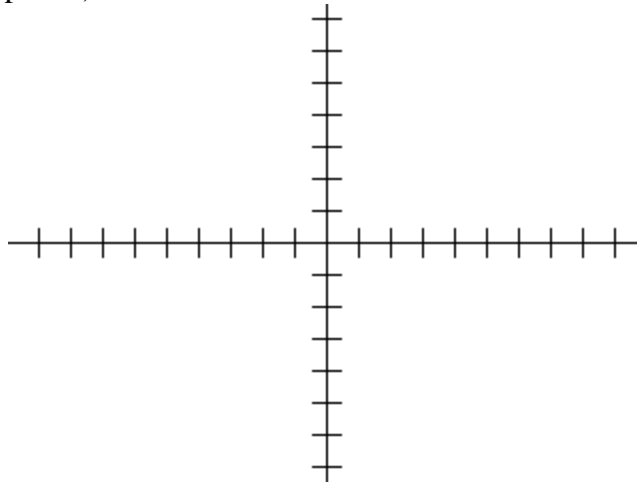


3. Given the function $f(x) = x^4 - 3x^2 - 2x$

- a. The order of this polynomial is _____. (1 point)
- b. We should be looking for _____ zeros. (how many?) (1 point)
- c. What is the end behavior of the function? (1 point)

d. Find all of the factors of the function. (4 points)

e. Graph the function. (5 points)



f. Use synthetic division to find $f(8)$. (3 points)

5. Give the domain and range of each of the following relations and determine which are functions. (3 points each)

a. $(x+1)^2 = y$
Domain _____
Range _____
Function? Yes No (Circle One)

b. $(y+1)^2 = x$
Domain _____
Range _____
Function? Yes No (Circle One)

c. $(y+1)^2 + x^2 = 1$
Domain _____
Range _____
Function? Yes No (Circle One)

6. Suppose

$$f(x) = 2x + 1$$

$$g(x) = x^2 + 2x + 1$$

Find each of the following values:
(4 points each)

a. $(f \circ g)(3)$

b. $(g \circ f)(3)$

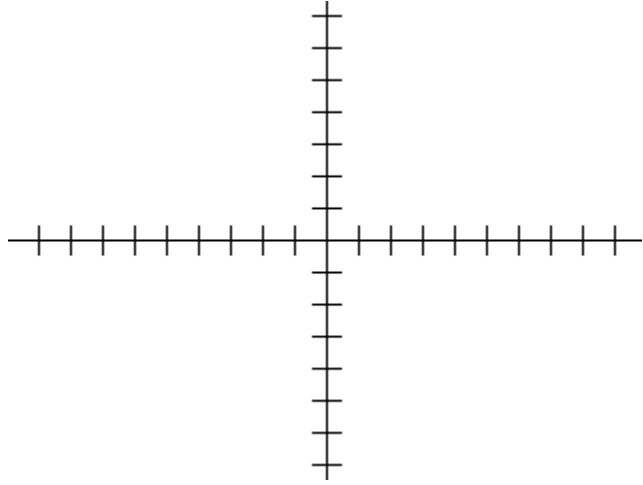
c. $(f \circ f)(3)$

d. $(g \circ g)(3)$

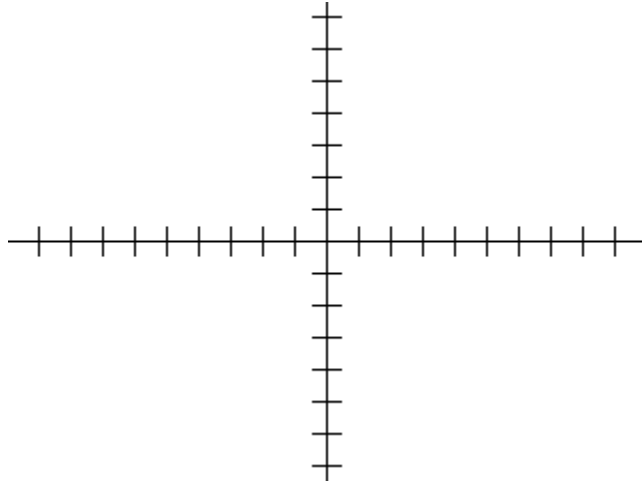
e. $(f + g)(3)$

7. Sketch the following functions on the axes provided. (5 points each)

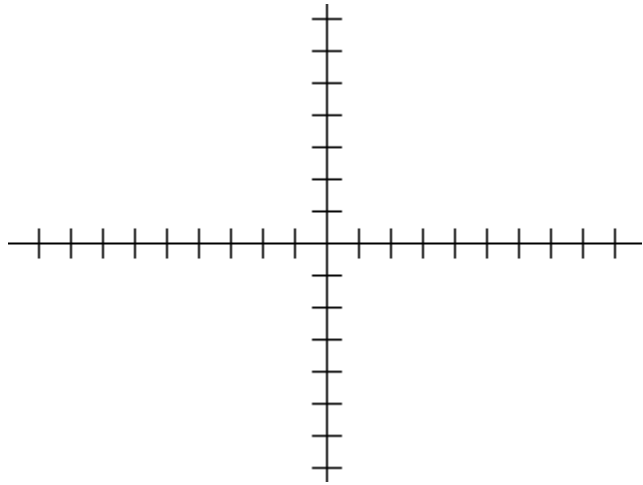
a. $y = |x| + 4$



b. $y = \sqrt{x-4} + 2$



c. $y = x^2 - 6x + 7$



8. Given $f(x) = \frac{x^2 - 1}{x - 2}$:

a. Find all asymptotes of this function. (3 points)

b. Find all zeros of this function. (3 points)

c. Graph this function. (5 points)

