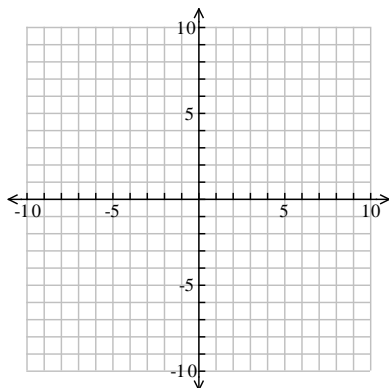


1. What is the standard equation of the circle whose diameter is the same length as the line segment with endpoints $(-9, -6)$ and $(7, -4)$ and whose center is the midpoint of the line segment with endpoints $(8, 3)$ and $(-6, 1)$?

2. It takes Destiny 15 minutes less than Julie to paint the walls of a 20' by 20' room. If they work together it takes them $\frac{91}{54}$ hours to paint the walls of a 20' by 20' room. How long would it take Julie to paint alone a 20' by 20' room?

3. Use the graph of $g(x) = x^2$ to graph $f(x) = -(x-3)^2 - 2$ on the same coordinate plane.

What are the x - and y -intercepts of $f(x)$?



4. What is the domain of the following functions?

a. $f(x) = \frac{x^2 - 49}{5x + 35}$

b. $f(x) = \frac{\sqrt[3]{5x + x^2}}{\sqrt{36 - x^2}}$

5. Test for symmetries $\sqrt{x^4 y^2} - xy^2 = \frac{2}{7x^6}$.

6. Find the equation of the line that passes through the point $(-6,1)$ and that is parallel to the line $6x - 7y = 10$.

7. Given $f(x) = -3x^2 + 4x - 1$.

a. Evaluate the difference quotient of $f(x)$.

b. Find the zero(s) of $f(x)$.

8. Use a graphing calculator to find the local extrema, rounding each coordinate to the nearest hundredth, for the function $f(x) = x^3 - 3x^2 + x + 2$.

11. What is the slope of the line perpendicular to the line that goes through points $(-9, -6)$ and $(7, -4)$?

12. Let $f(x) = \sqrt{3-x}$, $g(x) = x^2 - 4$, and $h(x) = -x + 2$.

a. Find $\left(\frac{g}{h}\right)(x)$ and its domain.

b. Find $(g \circ f)(x)$ and its domain.

c. Find $(g \circ f \circ h)(-1)$.

d. Find $f^{-1}(x)$.

13. Find the center, radius, and domain of the circle $3x^2 + 3y^2 = 4x - 78y - 508$.

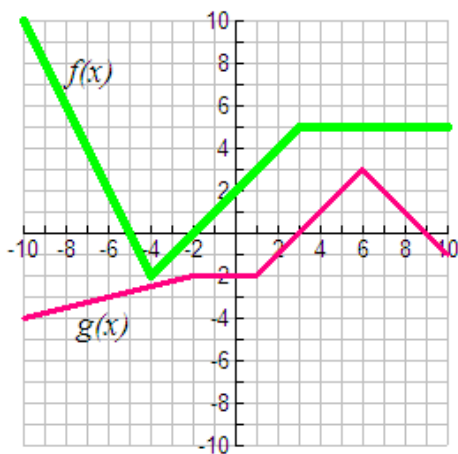
14. Algebraically prove or disprove $f(x) = \frac{2}{x+9}$ is a one-to-one function. If it is a one-to-one function, find its inverse function.

15. Find the zeros of the function $f(x) = -8x^2 + 2x - 10$.

16. Given the polynomial $p(x) = -35x^{43} + 7x^{59} - 48x^{50} + 100$.

- What is the degree of the polynomial?
- What is the leading coefficient?
- What is the leading term?
- What is the constant term?
- Describe the end behavior of the polynomial.

17. Given the graphs of $f(x)$ and $g(x)$, evaluate the following.



- $(f \circ g \circ f)(2) =$
- $(f - g)(-6) =$