

1. What is the domain of the function $f(x) = \sqrt{\frac{2-|x|}{1+x}}$? Explain how you go about finding it.

2. If $f(x) = x^3 + x + 1$, write an expression for $f(3x+1)$.

Write an expression for $f(-x)$.

For this function, is $f(-x) = f(x)$? (Is the function even?)

For this function, is $f(-x) = -f(x)$? (Is the function odd?)

3. Find an expression for the function whose graph is the line through the points (2,1) and (6,0).

4. If the graph of a certain function is determined by the expression $f(x) = x^3 + x^2$, write expressions for the graphs obtained from the graph of f as follows:

shift the graph of f downward 5 units

shift the graph of f to the left 3 units

reflect the graph of f about the x axis

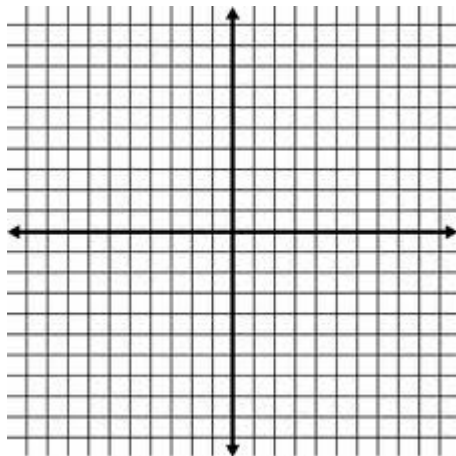
shrink the graph of f vertically by a factor of 4

5. Starting with the graph of $y = \sec(x)$, describe a sequence of transformations which will produce the graph of the expression $y = 3\sec(2x+1)$.
6. Find an expression for the composition $f \circ g$ of the functions $f(x) = x/(x-2)$ and $g(x) = \sin(x)$.

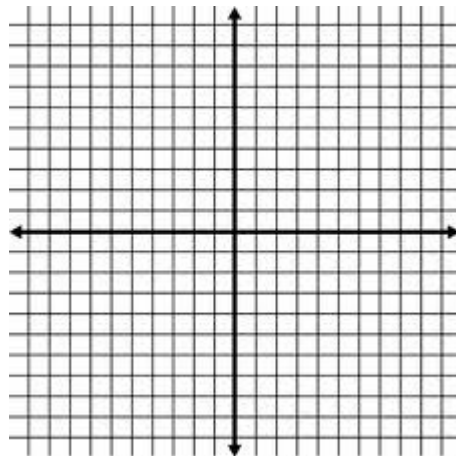
What is the domain of this composition of functions? What is the range?

7. Express $y = 2(1 + \sin(x))^2$ as the composition of two other simpler functions.
8. Use laws of exponents to rewrite and simplify $c^4(2c)^3$.
9. If $f(x) = 3x + 2$, find an expression for the inverse function $f^{-1}(x)$.
10. Solve the equation $2^{x+1} = 7$ for x . It's OK to express your answer in terms of a log function.

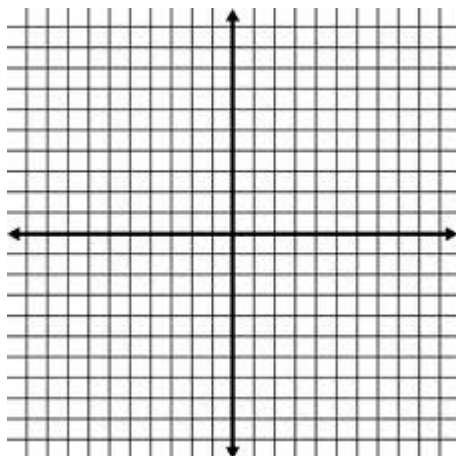
11. Sketch the graph of $y = 4 - 3x$.



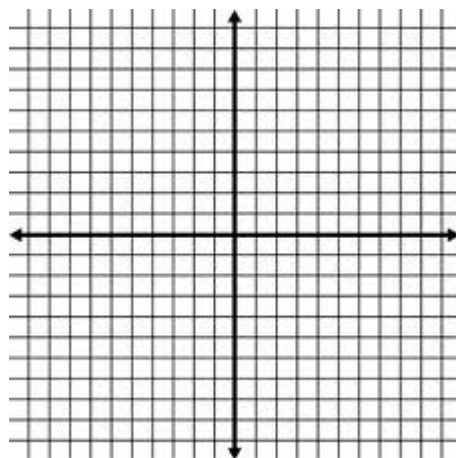
12. Sketch the graph of $y = 2 + |x - 1|$.



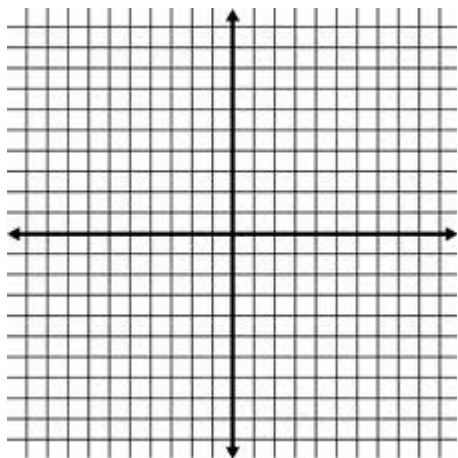
13. Sketch the graph of $y = 5x - x^2$.



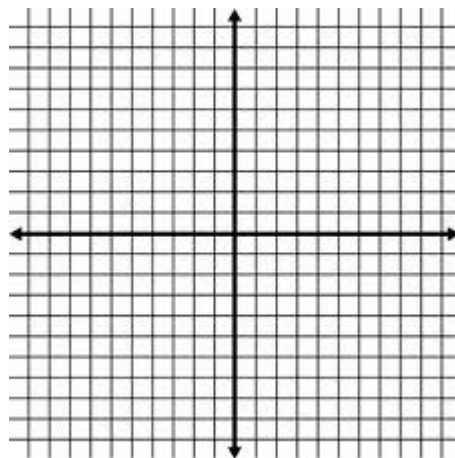
14. Sketch the graph of $y = (x - 1)(1 - x)(3 + x)$.



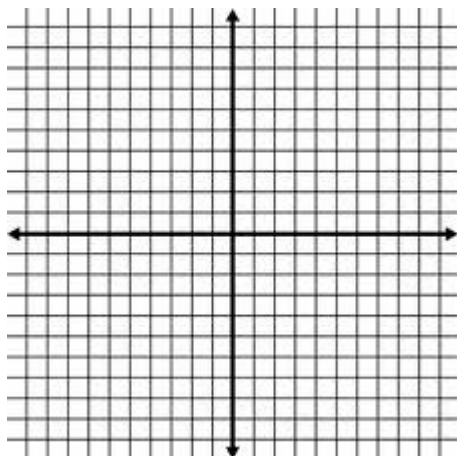
15. Sketch the graph of $y = 1/(1-x)$.



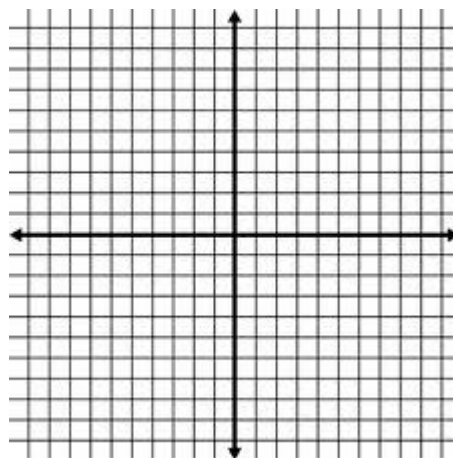
16. Sketch the graph of $y = 3 \sin(x - \pi/2)$.



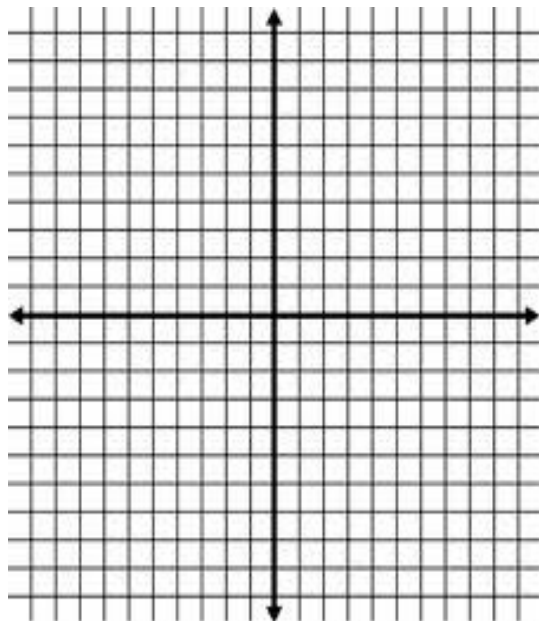
17. Sketch the graph of $y = 2^x$.



18. Sketch the graph of $y = \log_5(5x)$.



19. Sketch the graph of $y = \sin^{-1}(x)$. [You might want to sketch the graph of $y = \sin(x)$ first, and use that graph as a guide to your answer.]



20. Sketch the graph of $y = 2^{\sin(x)}$. [Note that the exponent is a periodic function, so this will also turn out to be a periodic function.]

