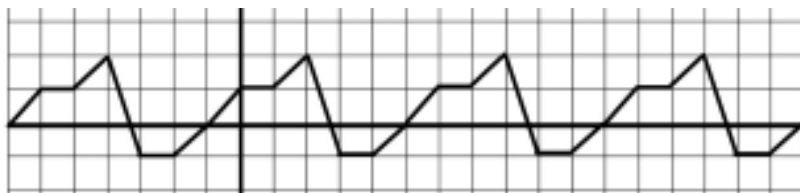


You must do your work on a separate piece of paper for full credit.

1. The graph of a cubic function has a local minimum at (5, -3) and a point of symmetry at (0, 4). At what point does the local maximum occur?
2. Find the point of symmetry of the graph of the cubic function $f(x) = -x^3 + 15x^2 - 48x + 45$. If the local minimum is (2, 1), find the local maximum.
3. $x = 7$ is the line of symmetry of a graph, and (2, 13) and (10, -6) are on the graph, then so are _____
4. If (7,3) is a point of symmetry for a graph and (-2, -4) and (10,-6) are on the graph, then so are _____
5. Test $x^2 + 2xy + 4 = 0$ to see if its graph has symmetry in the a) x axis; b) y axis; c) origin; d) $y = x$
6. Find the domain:
 - a. $f(x) = \frac{x}{x^2 - 4}$
 - b. $f(x) = \frac{x}{\sqrt{x^2 - 4}}$
 - c. $f(x) = \sqrt{x^2 - 5x + 6}$
7. Find the range:
 - a. $f(x) = x^2 - 4$
 - b. $f(x) = |x - 2| + 3$
8. $f(x) = \frac{1}{x}$; $g(x) = \sqrt{x - 1}$
 - a) Find the domain of $f(x)$ and the domain of $g(x)$.
 - b) Find $\left(\frac{g}{f}\right)(x)$
 - c) Find $f(g(x))$ and its domain.
 - d) Find $g^{-1}(x)$.
 - e) Find $f^{-1}(f(x))$
 - f) Find $g(g^{-1}(15))$
9. An open-top box with a square base is to be constructed from a sheet metal in such a way that the completed box is made of $2m^2$ of sheet metal. Express the volume of the box as a function of the base width.
10. A light 20 ft above the ground causes a man 6ft tall to cast a shadow x ft long on the ground. Express x as a function of d (the man's distance from the light).
11. Graph $f^{-1}(x)$ on the same set of axes.





12. Find:

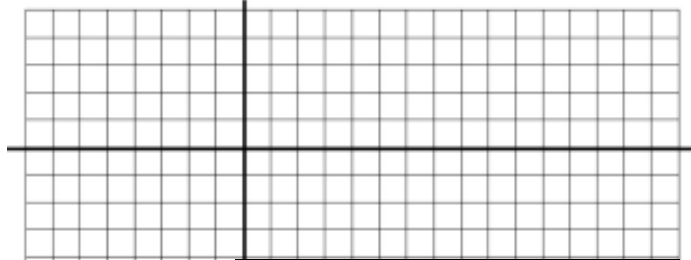
a) period

c) $f(45)$

b) amplitude

d) $f(-70)$

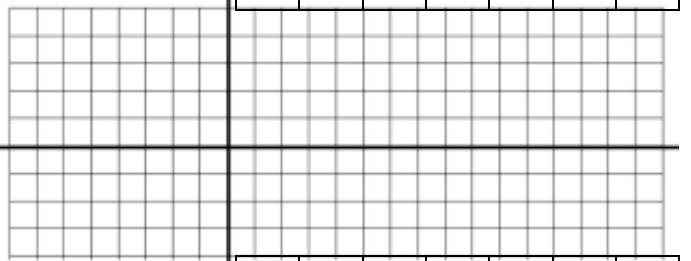
13. $y = -f(x)$



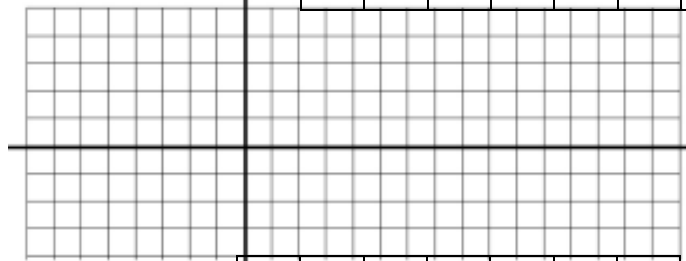
14. $y = f(-x)$



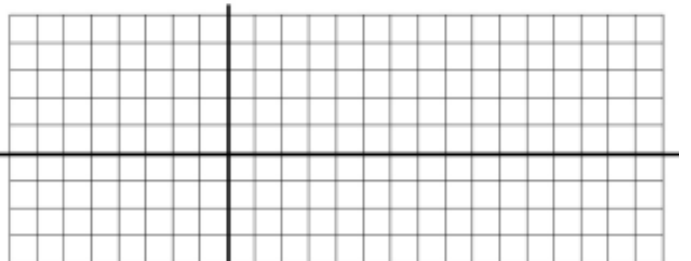
15. $y = |f(x)|$



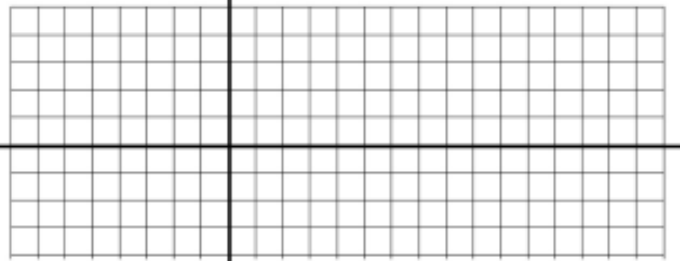
16. $y+1 = f(x-2)$



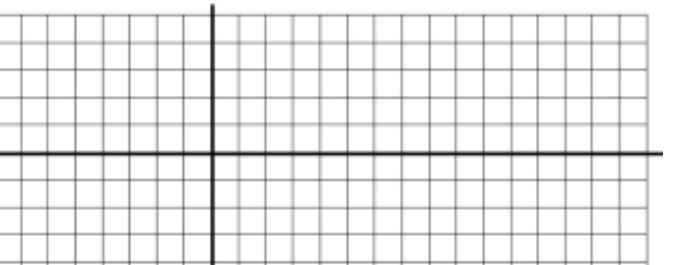
17. $y = 2f(x)$



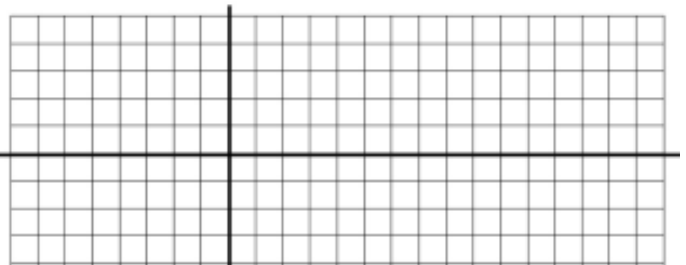
18. $y = f(2x)$



19. $y = \frac{1}{2}f(x)$



20. $y = f\left(\frac{1}{2}x\right)$



21. x and y switched

