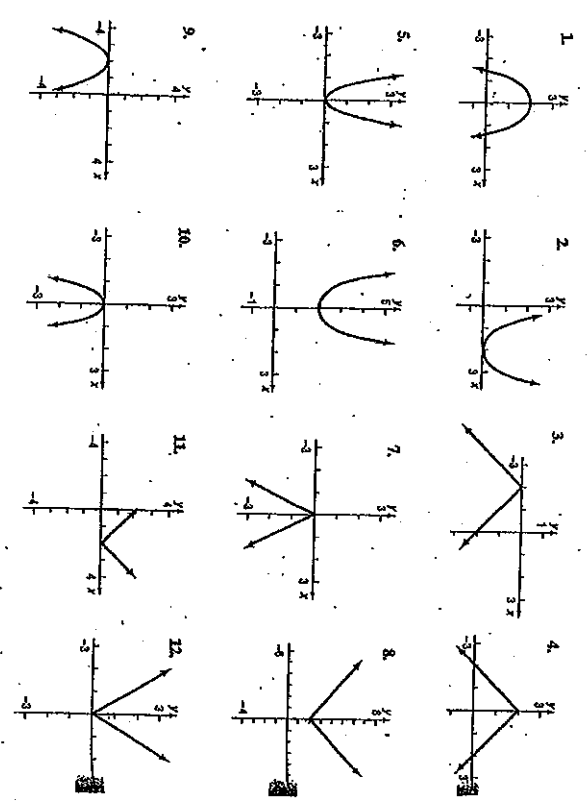


# Ch. 1 Section 1.3 Shifting, Reflecting, and Stretching Graphs HW

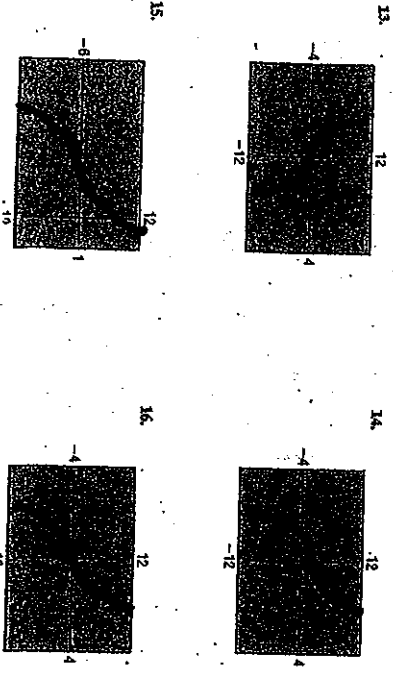
In Problems 1-12, match each graph to one of the following functions:

- A.  $y = x^2 + 2$
- B.  $y = -x^2 + 2$
- C.  $y = |x| + 2$
- D.  $y = -|x| + 2$
- E.  $y = (x-2)^2$
- F.  $y = -(x+2)^2$
- G.  $y = |x-2|$
- H.  $y = -|x+2|$
- I.  $y = 2x^2$
- J.  $y = -2x^2$
- K.  $y = 2|x|$
- L.  $y = -2|x|$



In Problems 13-16, match each graph to one of the following functions:

- A.  $y = x^2$
- B.  $y = (x+2)^2$
- C.  $y = -2x^2$
- D.  $y = x^2 + 2$



In Problems 17-24, write the function whose graph is the graph of  $y = x^2$  but is:

- 17. Shifted to the right 4 units
- 18. Shifted to the left 4 units
- 19. Shifted up 4 units
- 20. Shifted down 4 units
- 21. Reflected about the y-axis
- 22. Reflected about the x-axis
- 23. Vertically stretched by a factor of 4
- 24. Horizontally stretched by a factor of 4

In Problems 25-54, graph each function by hand using the techniques of shifting, compressing, stretching, and/or reflecting. Start with the graph of the basic function (for example,  $y = x^2$ ) and show all steps. Verify your answer by using a graphing utility.

- 25.  $f(x) = x^2 - 1$
- 26.  $f(x) = x^2 + 4$
- 27.  $g(x) = x^2 + 1$
- 28.  $g(x) = x^2 - 1$
- 29.  $h(x) = \sqrt{x-2}$
- 30.  $h(x) = \sqrt{x+1}$
- 31.  $f(x) = (x-1)^2$
- 32.  $f(x) = (x+2)^2$
- 33.  $g(x) = 4\sqrt{x}$
- 34.  $g(x) = \frac{1}{2}\sqrt{x}$
- 35.  $h(x) = 2x$
- 36.  $h(x) = \frac{4}{x}$
- 37.  $f(x) = -|x|$
- 38.  $f(x) = -\sqrt{x}$
- 39.  $g(x) = -\frac{1}{x}$
- 40.  $g(x) = -x^3$
- 41.  $h(x) = \ln(-x)$
- 42.  $h(x) = \frac{1}{x}$
- 43.  $f(x) = (x+1)^2 - 3$
- 44.  $f(x) = (x-2)^2 + 1$
- 45.  $g(x) = \sqrt{x-2} + 1$
- 46.  $g(x) = |x+1| - 3$
- 47.  $h(x) = \sqrt{-x} - 2$
- 48.  $h(x) = \frac{4}{x} + 2$
- 49.  $f(x) = (x+1)^2 - 1$
- 50.  $f(x) = 4\sqrt{x-1}$
- 51.  $g(x) = 2|x-4|$
- 52.  $g(x) = 4\sqrt{2-x}$
- 53.  $h(x) = 2\ln(x-1)$
- 54.  $h(x) = -x^2 + 2$