5. \[ y = f(x) \]

5a) \[ y = 2f(x) \]

Parent graph of \( y = f(x) \)

\[ y = 2f(x) \] stretches graph by a factor of 2 away from the x-axis (x-axis is anchor)

5b) \[ y = -\frac{1}{2}f(x) \]

\[ y = -\frac{1}{2}f(x) \] reflects graph over the x-axis and compresses graph by a factor of \( \frac{1}{2} \) toward the x-axis

5c) \[ y = f(-2x) \]

\[ y = f(-2x) \] reflects graph over the y-axis & compresses graph by a factor of 2 toward the y-axis (y-axis is an anchor)

5d) \[ y = f\left(\frac{x}{2}\right) \]

\[ y = f\left(\frac{x}{2}\right) \] stretches graph by a factor of 2 away from the y-axis

5e) \[ y = f(x - \frac{1}{2}) \]

5f) Shift up 1

\[ y = f(-x) + 1 \]
7c) $y - 4 = |x + 5| \rightarrow y = |x + 5| + 4$ shift absolute value graph 5 to the left and up 4.

7d) $y = 2|x + 1|$ shifts absolute value graph 1 to the left and then stretches graph by a factor of 2 away from the x-axis.

7e) $y + 1 = -|x| \rightarrow y = -|x| - 1$ reflects graph over x-axis and shifts graph down 1.

7f) $y - 3 = |2x|$ graph is stretched vertically away from the x-axis by a factor of 2 and shifted up 3.
8. parent graph \( y = \sqrt{x} \)

a) \( y = \sqrt{x} + 1 \) shifts graph of \( \sqrt{x} \) up 1

b) \( y = \sqrt{x} + 4 \) shifts graph of \( \sqrt{x} \) left 4

c) \( y = \sqrt{x-5} - 2 \) shifts graph of \( \sqrt{x} \) right 5 and down 2

d) \( y = 2 \sqrt{x-3} \) shifts graph of \( \sqrt{x} \) right 3 and stretches it from x-axis by a factor of 2 (graph climbs twice as fast)

e) \( y = \sqrt{-x} + 2 \) reflects graph of \( \sqrt{x} \) over the y-axis and up 2

f) \( y = \sqrt{4x} + 4 = 2\sqrt{x} + 4 \) stretches graph of \( \sqrt{x} \) by a factor of 2 (climbs twice as fast) and up 4
9. parent graph \( y = 2^x \)
   a) \( y = 2^{-x} \) reflects graph of \( 2^x \) over the y-axis
   b) \( y = 2^{x-1} \) shifts graph of \( 2^x \) right 1
   c) \( y = 3 - 2^x \) reflects graph of \( 2^x \) over x-axis and up 3
   d) \( x = 2^y \) is inverse of \( 2^x \), a reflection over \( y = x \) (switch x & y coordinates)

10. \( y = \frac{1}{x} \)
    a) \( y = -\frac{1}{x} \)
    b) \( y = \frac{1}{x-2} \) shift graph right 2
    c) \( y = 1 + \frac{1}{x} \)
    d) \( x = \frac{1}{y} \) is inverse of \( y = \frac{1}{x} \) (same graph)