

Parent Functions

Linear Functions: $y = mx + b \rightarrow f(x) = mx + b$

Parent Function: $y = x \rightarrow f(x) = x$
 $m = 1$ $b = 0$

Ways to Compare

① Vertical Stretch or Vertical Shrink

- If $|m| > 1$, Vertical Stretch

- If $|m| < 1$, Vertical Shrink

- $|m| \rightarrow -$ does not affect Stretch/Shrink

② Reflection across y-axis

- When m is $-$

③ Shifts up or down

- y-intercept

$$f(x) = 3x + 2$$

- Vertical Stretch with a factor of 3

- Shifts up 2 units

$$f(x) = \frac{1}{2}x + 4$$

- Vertical Shrink with a factor of

$\frac{1}{2}$

- Shifts up 4 units.

$$f(x) = -\frac{4}{5}x$$

- Reflection across y-axis

- Vertical Shrink with a factor of $\frac{4}{5}$

$$f(x) = x - 3$$

- Shifts down 3 units

Parent Functions

Linear Functions: $y = mx + b$ $f(x) = -5x - 5$

Parent Function: x - Reflection across

y -axis $m = 1$

- Shifts down

5 units

- Vertical Stretch with a factor

of 5

- $|m| < 1$ - does not affect stretch/shrink

② Reflection across y -axis

- When m is -

③ Shifts up or down

- y -intercept

$f(x) = 3x + 5$

- Vertical stretch with

a factor of 3

- Shifts up 5 units

$f(x) = \frac{1}{5}x$

- Reflection across

y -axis

- Vertical stretch

with a factor

of $\frac{1}{5}$

$f(x) = \frac{1}{5}x + 4$

- Vertical stretch

with a factor of

$\frac{1}{5}$

- Shifts up 4 units

$f(x) = x - 3$

- Shifts down 3 units