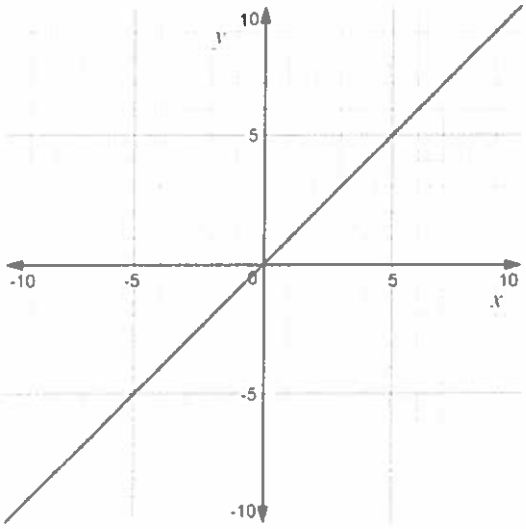
Transformations of Linear Functions

$y = a(x-h)+k$

1. Describe the translation in g(x) = x – 2 as it relates to the graph of the parent function.



Parent

$f(x) = x$

$y = x$

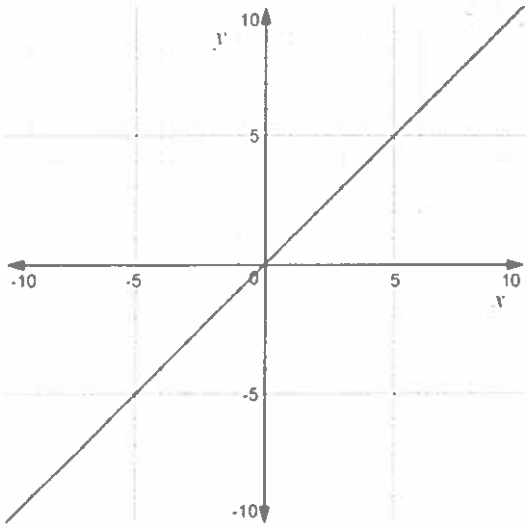
$K: -2$

Down 2

2. Describe the translation in g(x) = x + 3 as it relates to the graph of the parent function.

Up 3

3. Describe the translation in g(x) = (x + 5) as it relates to the graph of the parent function.



$y = a(x-h)+k$

$h = -5$

(h is opposite)

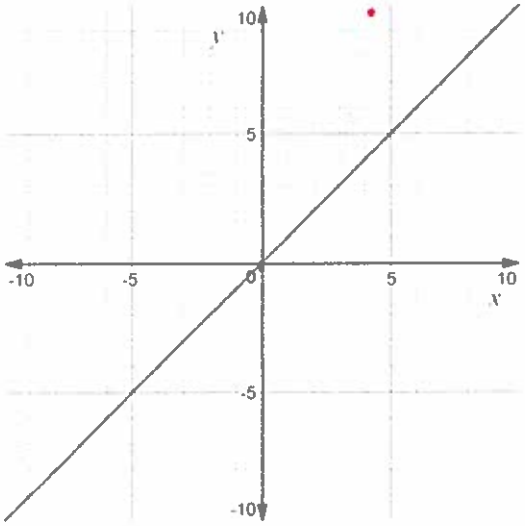
left 5

4. Describe the translation in g(x) = (x - 7) as it relates to the graph of the parent function.

Right 7

Transformations of Linear Functions

5. Describe the translation in g(x) = (x – 6) + 3 as it relates to the graph of the parent function.

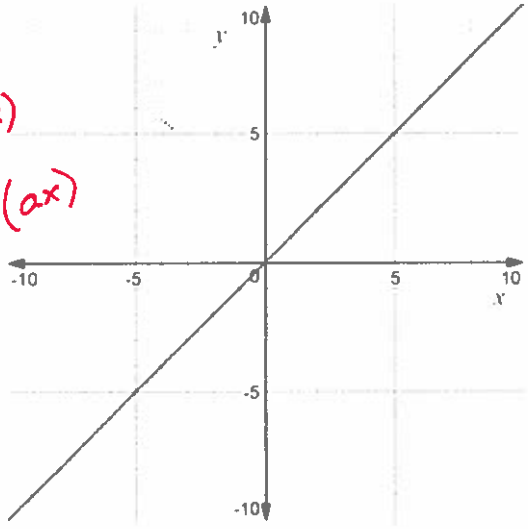


Right 6
Up 3

6. Describe the translation in g(x) = (x - 4) + 10 as it relates to the graph of the parent function.

Right 4
Up 10

7. Describe the translation in g(x) = 2(x) as it relates to the graph of the parent function.

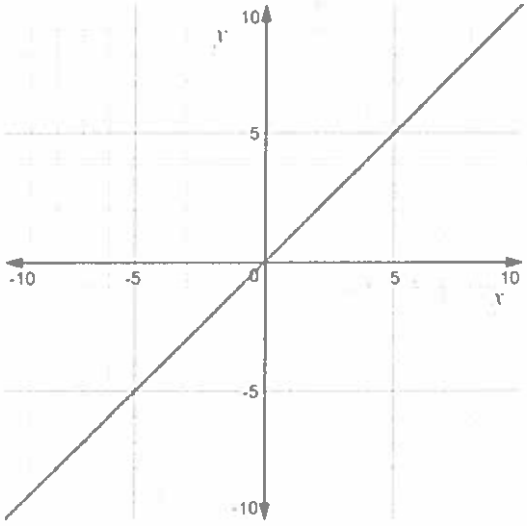


a-values
- Vertical a(x)
- Horizontal (ax)

Vertical Stretch

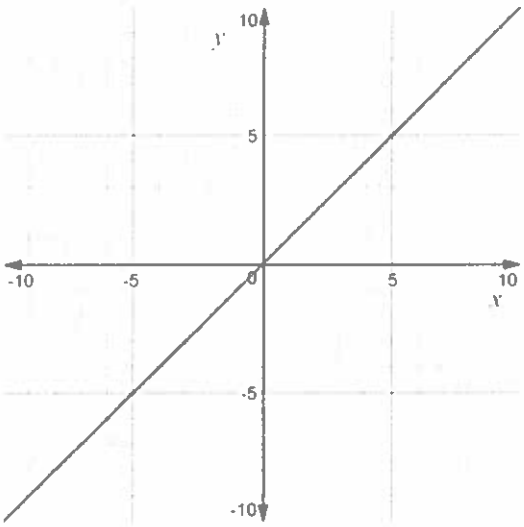
Transformations of Linear Functions

8. Describe the translation in g(x) = (1/4x) as it relates to the graph of the parent function.



Horizontal stretch

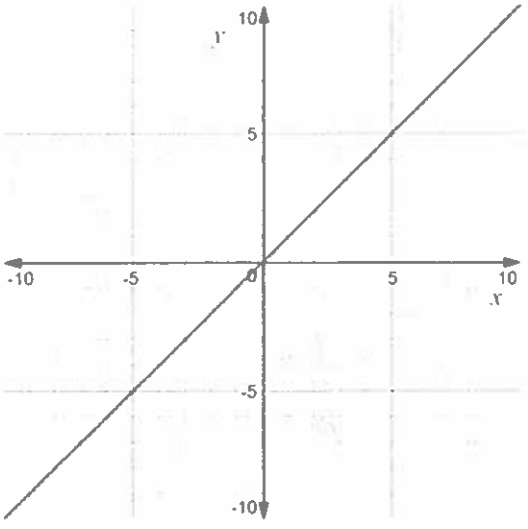
9. Describe the translation in g(x) = -½(x) as it relates to the graph of the parent function.



Vertical compression

Reflect over x-axis

10. Describe the translation in g(x) = (-3x) as it relates to the graph of the parent function.



- Horizontal compression
- Reflect over y-axis

- $y = -\frac{2}{5}(x-4) - 3$
  - Down 3
  - Right 4
  - Vert. compress
  - Reflect over x-axis

- $y = (6x + 8) - 1$
  - Down 1
  - left 8
  - Horiz. compress

$y = a(x-h)+k$

- Vertical / Horizontal
  - $a(x)$ (ax)
- Left and right
  - $(x+h)$ $(x-h)$
- Negative a → Reflect
- Up $+k$ and down $-k$
- Steeper / Flatter
  - $a > 1$ / $a < 1$
  - Vert. Stretch / Vert compress
  - Horiz. compress / Horiz. stretch