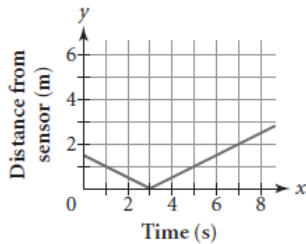


## LESSON 8.4 • Stretching and Shrinking Graphs

1. a.  $y = |x - 3|$

- b. Greta starts 3 m from the sensor and walks toward the sensor at 1 m/s. At 3 s, she is at the sensor. Then she walks away from the sensor at the same rate for another 5 s.

2. a.



b.  $y = 0.5|x - 3|$

3. a.  $y = 3|x|$

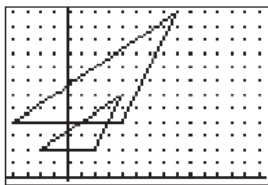
b.  $y = 0.5(x - 2)^2$

c.  $y = -2|x| + 4$  or  $y - 4 = -2|x|$

d.  $y = 2(x + 1)^2 - 5$  or  $y + 5 = 2(x + 1)^2$

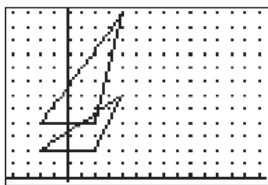
4. a. Shrink the function  $y = |x|$  vertically by a factor of 0.25 and then translate it right 4 units and down 3 units.
- b. Reflect the function  $y = x^2$  over the  $x$ -axis, shrink it vertically by a factor of 0.5, and then translate it left 3 units and up 2 units.
- c. Stretch the function  $y = x$  vertically by a factor of 3 and then translate it left 5 units and down 4 units.

5. a. A horizontal and vertical stretch by a factor of 2



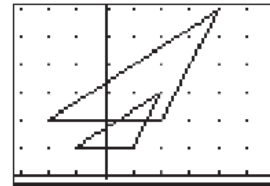
$[-4.4, 14.4, 1, -0.2, 12.2, 1]$

- b. A vertical stretch by a factor of 2



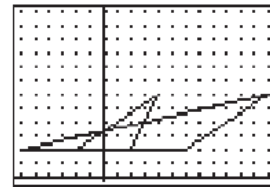
$[-4.4, 14.4, 1, -0.2, 12.2, 1]$

- c. A horizontal and vertical shrink by a factor of 0.5



$[-3.2, 5.2, 1, -0.1, 6.1, 1]$

- d. A horizontal stretch by a factor of 3



$[-6.4, 12.4, 1, -0.2, 12.2, 1]$