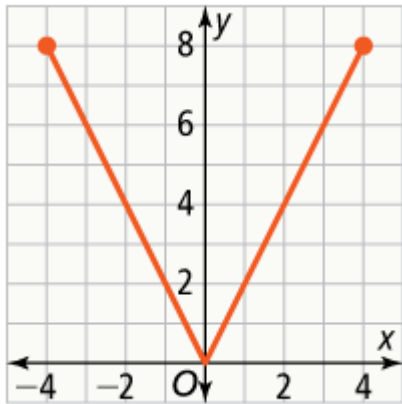


10. The domain remains all real numbers. The range changes from $y \geq 0$ to $y \leq 0$.
11. Answers may vary. Sample:
- Both have linear sections.
 - Both have a domain of all real numbers.
 - Both have the same values when $x \geq 0$.
 - The graph of $f(x) = |x|$ is symmetric about the y -axis, but the graph of $f(x) = x$ is not.
 - The graphs have opposite values when $x < 0$.
 - The range of $f(x) = |x|$ is $y \geq 0$, but the range of $f(x) = x$ is all real numbers.
 - Both have an x -intercept and y -intercept at the origin.
 - When $x < 0$ the graph of $f(x) = |x|$ is decreasing, but the graph of $f(x) = x$ is increasing.
12. The range of the function $f(x) = 10x$ is not 10 times the range of $f(x) = |x|$. The range is the same for both functions, $y \geq 0$.
13. -1 and 1 ; Answers may vary. Sample: The slopes of the two sides of the graph of $g(x) = a|x|$ are $-a$ and a . The product of the slopes must be -1 if there is a right angle at the vertex, so $-a^2 = -1$, so $a = -1$ or $a = 1$.

14.

| x | $g(x) = a x $ |
|------|---------------|
| -4 | b |
| -1 | a |
| 0 | 0 |
| 1 | a |
| 4 | b |
| 8 | $2b$ |

15. a.



b. 2

c. The rate of change is equal to the coefficient of the absolute value term.

16. yes; (-11, 11)

17. no

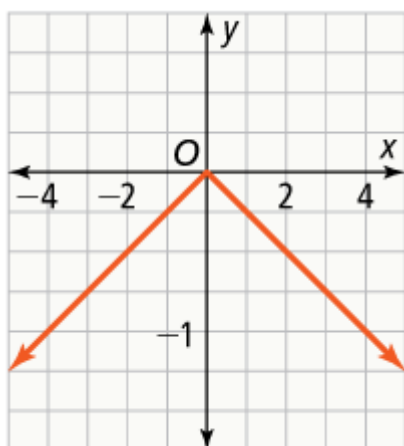
18. no

19. no

20. yes; (8, 8)

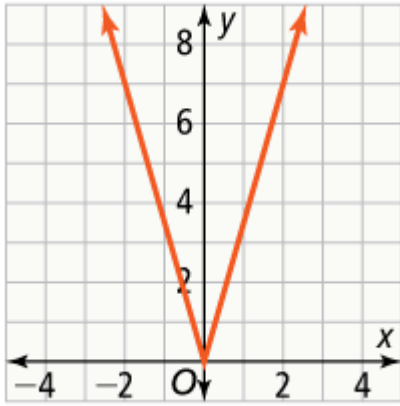
21. no

22.



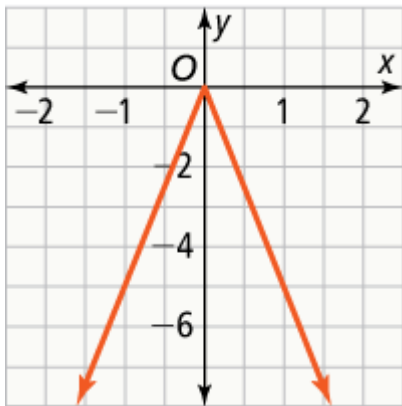
Domain: all real numbers; Range: $y \leq 0$

23.



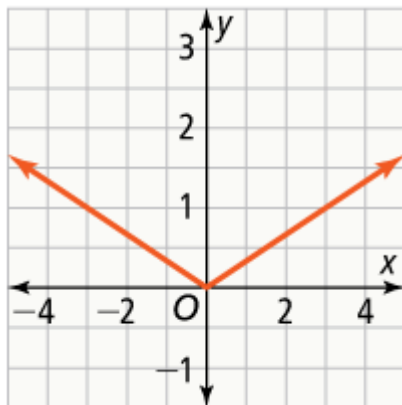
Domain: all real numbers; Range: $y \geq 0$

24.



Domain: all real numbers; Range: $y \leq 0$

25.



Domain: all real numbers; Range: $y \geq 0$

26. He walked 3 miles, because he was 1.5 miles from the water stop at the start and at the finish of the race, so he walked 1.5 miles to the water stop and then 1.5 miles from the water stop.

27. $\frac{4}{3}$ ft/s

28. $-\frac{4}{3}$ ft/s

29. $g(x) = 3|x|$

30. $g(x) = -4|x|$

31. The function modeling the lines through A and B is $f(x) = \frac{1}{4}|x|$.

The function modeling the lines through A and B is $g(x) = \frac{3}{2}|x|$.

32. -20 ; The rate means that the bicyclist is traveling toward the sandwich shop at a speed of 20 mi/h.

33. 18 ft

34. downward; -100 or 100

35. D

36. **Part A** $f(x) = 2|x|$

Part B The vertex is $(0, 0)$. The function is increasing over the interval $0 < x < 250$ and decreasing over the interval $-150 < x < 0$. The minimum value is 0.

Part C $(50, 0)$.

Part D $f(x) = \frac{4}{3}|x - 50|$.