

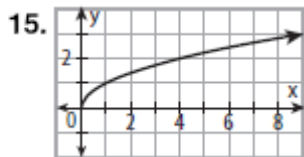
Foundations for Functions Introduction to Functions

- D: {Irene, Anna, Lea, Kate}
R: {12, 16, 22}
- function; Each value in the domain is mapped to only one value in the range.
- not a function; Possible answer: (1, 1) and (1, -1).
- function

$$\begin{aligned}
 9. \quad f(0) &= -(0)^2 + 0 \\
 &= 0 \\
 f\left(\frac{3}{2}\right) &= -\left(\frac{3}{2}\right)^2 + \frac{3}{2} \\
 &= -\frac{3}{4} \\
 f(-1) &= -(-1)^2 + (-1) \\
 &= -2
 \end{aligned}$$

$$\begin{aligned}
 11. \quad f(0) &= 2 \\
 f\left(\frac{3}{2}\right) &= 5 \\
 f(-1) &= 0
 \end{aligned}$$

$$\begin{aligned}
 13. \quad f(0) &= 0 \\
 f\left(\frac{3}{2}\right) &= 3 \\
 f(-1) &= \frac{1}{2}
 \end{aligned}$$



- Let m represent the number of miles over the speed limit.
 $f(m) = 160 + 4m$
 $f(8) = 160 + 4(8)$
 $= 192$
 A fine of \$192 for driving 8 mi/h over the speed limit.

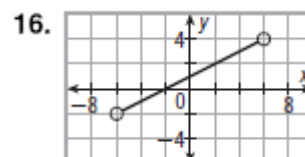
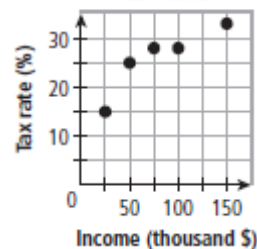
- D: {-3, 2, 3, 4}
R: {-2, 1, 3, 4}
- not a function; The value 3 is mapped onto two values, 1 and 0.

$$\begin{aligned}
 6. \quad &\text{function} \\
 8. \quad f(0) &= 7(0) - 4 \\
 &= -4 \\
 f\left(\frac{3}{2}\right) &= 7\left(\frac{3}{2}\right) - 4 \\
 &= \frac{13}{2} \\
 f(-1) &= 7(-1) - 4 \\
 &= -11
 \end{aligned}$$

$$\begin{aligned}
 10. \quad f(0) &= -2(0)^2 + 1 \\
 &= 1 \\
 f\left(\frac{3}{2}\right) &= -2\left(\frac{3}{2}\right)^2 + 1 \\
 &= -\frac{7}{2} \\
 f(-1) &= -2(-1)^2 + 1 \\
 &= -1
 \end{aligned}$$

$$\begin{aligned}
 12. \quad f(0) &= 4 \\
 f\left(\frac{3}{2}\right) &= 4 \\
 f(-1) &= -1
 \end{aligned}$$

- 2003 Federal Income Tax Rates

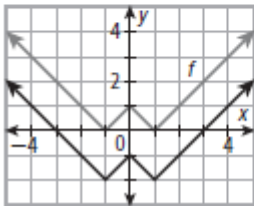


- (5, 1)

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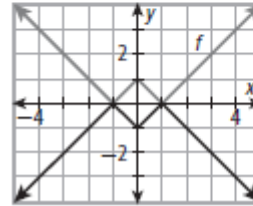
19. (3, 5)

21. x	y	$y - 2$
-3	2	$2 - 2 = 0$
-1	0	$0 - 2 = -2$
0	1	$1 - 2 = -1$
1	0	$0 - 2 = -2$
3	2	$2 - 2 = 0$

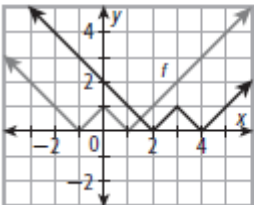


20. (-2, -3)

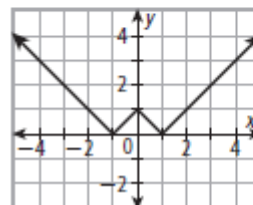
22. x	y	$-y$
-3	2	$-1(2) = -2$
-1	0	$-1(0) = 0$
0	1	$-1(1) = -1$
1	0	$-1(0) = 0$
3	2	$-1(2) = -2$



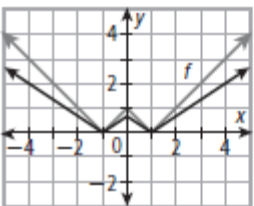
23. $x + 3$	x	y
$-3 + 3 = 0$	-3	2
$-1 + 3 = 2$	-1	0
$0 + 3 = 3$	0	1
$1 + 3 = 4$	1	0
$3 + 3 = 6$	3	2



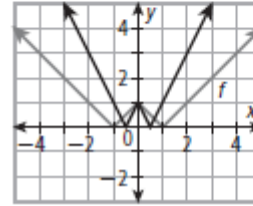
24. $-x$	x	y
$-1(-3) = 3$	-3	2
$-1(-1) = 1$	-1	0
$-1(0) = 0$	0	1
$-1(1) = -1$	1	0
$-1(3) = -3$	3	2



25. x	y	$\frac{2}{3}y$
-3	2	$\frac{2}{3}(2) = \frac{4}{3}$
-1	0	$\frac{2}{3}(0) = 0$
0	1	$\frac{2}{3}(1) = \frac{2}{3}$
1	0	$\frac{2}{3}(0) = 0$
3	2	$\frac{2}{3}(2) = \frac{4}{3}$



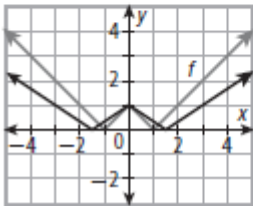
26. $\frac{1}{2}x$	x	y
$\frac{1}{2}(-3) = -\frac{3}{2}$	-3	2
$\frac{1}{2}(-1) = -\frac{1}{2}$	-1	0
$\frac{1}{2}(0) = 0$	0	1
$\frac{1}{2}(1) = \frac{1}{2}$	1	0
$\frac{1}{2}(3) = \frac{3}{2}$	3	2



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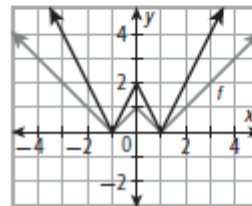
27.

$\frac{3}{2}x$	x	y
$\frac{3}{2}(-3) = -\frac{9}{2}$	-3	2
$\frac{3}{2}(-1) = -\frac{3}{2}$	-1	0
$\frac{3}{2}(0) = 0$	0	1
$\frac{3}{2}(1) = \frac{3}{2}$	1	0
$\frac{3}{2}(3) = \frac{9}{2}$	3	2



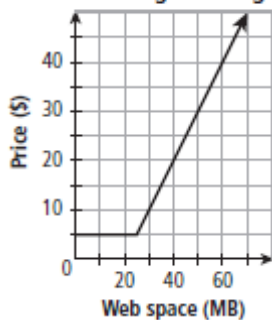
28.

x	y	$2y$
-3	2	$2(2) = 4$
-1	0	$2(0) = 0$
0	1	$2(1) = 2$
1	0	$2(0) = 0$
3	2	$2(2) = 4$



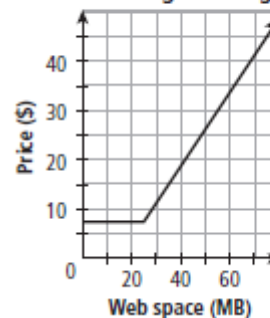
29. vertical shift down 5 units

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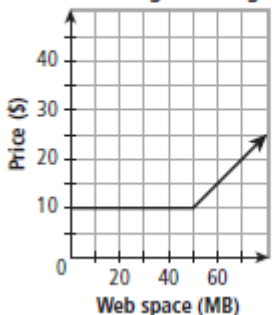
30. vertical compression by a factor of $\frac{3}{4}$

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31. horizontal stretch by a factor of 2

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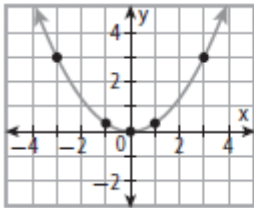


32. $g(x) = x^2 - 1$ is quadratic.
 $g(x) = x^2 - 1$ represents a translation of the quadratic parent function 1 unit down.

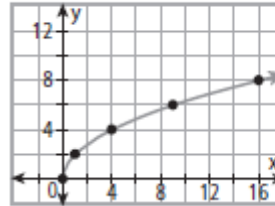
33. $g(x) = \sqrt{x - 2}$ is a square root.
 $g(x) = \sqrt{x - 2}$ represents a translation of the square root parent function 2 units right.

34. $g(x) = x^3 + 3$ is cubic.
 $g(x) = x^3 + 3$ represents a translation of the cubic parent function 3 units up.

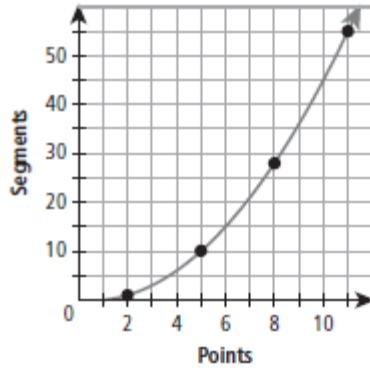
35. The data points resemble a quadratic function. The data set is a vertical compression or horizontal stretch of the quadratic parent function by a factor of $\frac{1}{3}$ or 3, respectively.



36. The data points resemble a square root function. The data set is a vertical stretch or horizontal compression of the quadratic parent function by a factor of 2 or $\frac{1}{2}$, respectively.



37.a.



- b. quadratic parent function
c. 10 points
d. 21 segments