

Algebra 1 Chapter 3 Practice Test

1. Which of the following represent functions?

I.

Input	Output
4	0
5	0
6	-1
7	-1

II.

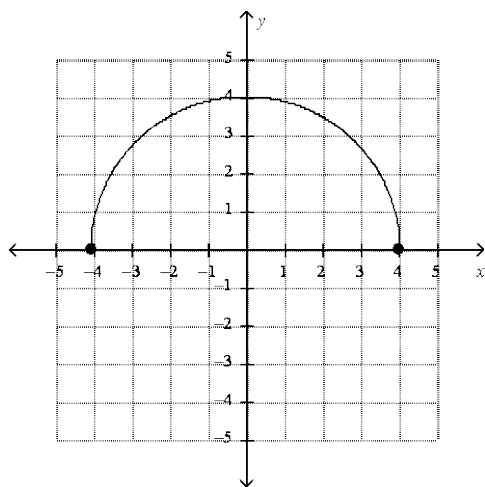
Input	Output
2	8
4	6
6	4
8	2

III.

Input	Output
-2	0
1	1
1	2
2	3

- All
- I and II
- I and III
- II and III

2. Determine whether the graph represents a function.



- The relation is not a function.
- The relation is a function.

3. Does the input-output table represent a function? If it does represent a function, list the domain and range.

Input	1	2	3	4
Output	7	11	15	19

4. Which of the following data sets is best described by a linear function?

- $\{(1, 0), (2, 0), (3, 2), (4, 2)\}$
- $\{(-5, -2), (-6, 2), (-7, -2), (-8, 2)\}$
- $\{(-1, -8), (0, -6), (1, -4), (2, -2)\}$
- $\{(10, 5), (11, 8), (12, 12), (13, 17)\}$

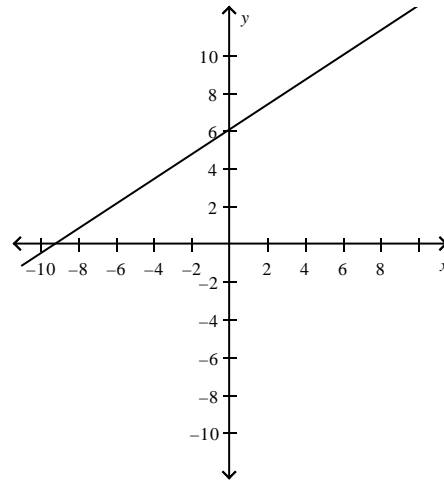
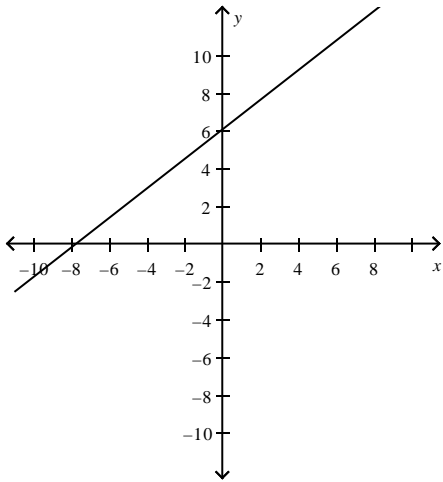
5. Classify the function as discrete or continuous for the given domain. Then identify the range of the function.

$$y = \frac{1}{2}x + 6; \text{ domain } x \geq 4$$

6. Classify the function as discrete or continuous for the given domain. Then identify the range of the function.

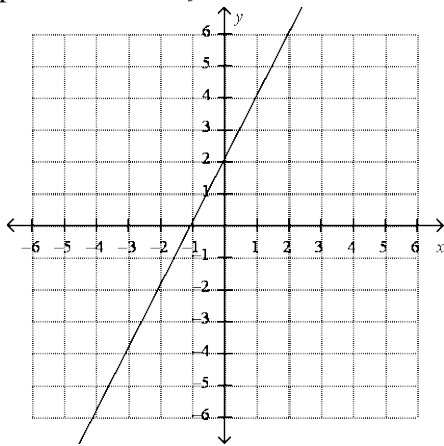
$$y = \frac{1}{2}x + 5; \text{ domain: } x = -4, -2, 0, 2, 4$$

7. At a convenience store, bottles of water cost \$1.20 each. The function $f(x) = 1.2x$ gives the cost of buying x bottles. Give a reasonable domain and range for the function in this context.
8. Evaluate $f(x) = 3x - 9$, when $x = -2$.
- | | |
|--------|--------|
| a. -18 | c. -3 |
| b. -33 | d. -15 |
9. For $f(x) = 3x + 18$, what is the value of x for which $f(x) = 21$?
- | | |
|------------|-------------|
| a. $x = 2$ | c. $x = 1$ |
| b. $x = 5$ | d. $x = -1$ |
10. The domain of the function f is the set of integers greater than -8 . Which of the following values represent elements of the range of f ?
- | | |
|-------------|--------------------------------|
| a. $f(2.5)$ | e. $f\left(\frac{1}{5}\right)$ |
| b. $f(-2)$ | f. $f(0)$ |
| c. $f(-8)$ | g. $f(8)$ |
| d. $f(4)$ | h. $f(-12)$ |
11. For the function f , each range value is associated with only one domain value. The range of f is $\left\{f\left(\frac{2}{7}\right), f(7), f(9.7), f(14), f(21)\right\}$. What is the domain of f ? Explain your answer.
12. Use intercepts to graph the linear equation $2x - 3y = -18$.
- | | |
|---|--|
| a. x-intercept: $-\frac{15}{2}$, y-intercept: $\frac{22}{3}$ | c. x-intercept: -9 , y-intercept: $\frac{22}{3}$ |
|---|--|
-
- | | |
|--|---------------------------------------|
| b. x-intercept: $-\frac{15}{2}$, y-intercept: 6 | d. x-intercept: -9 , y-intercept: 6 |
|--|---------------------------------------|

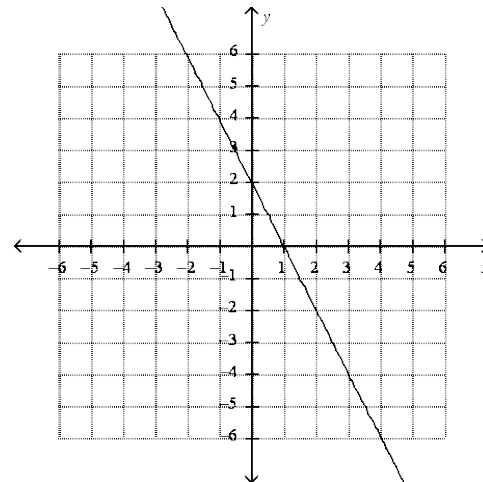


13. Graph the function $y = -2x + 2$.

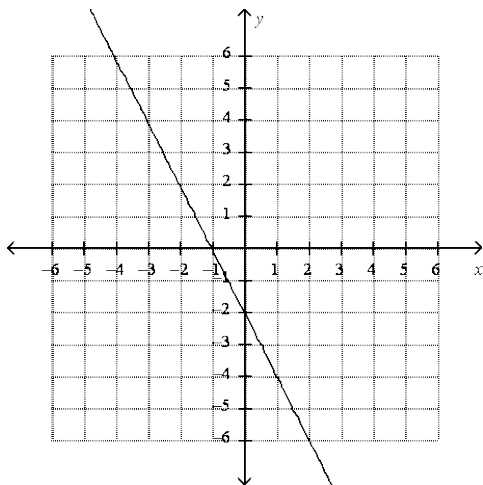
a.



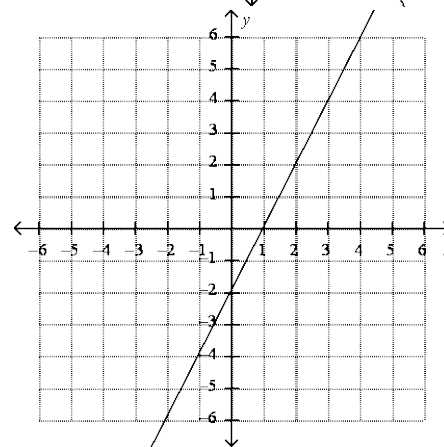
c.



b.

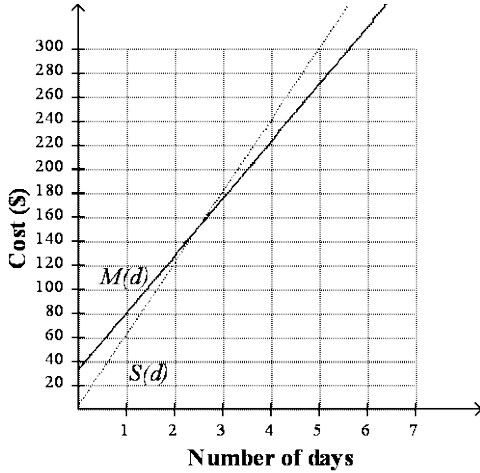


d.



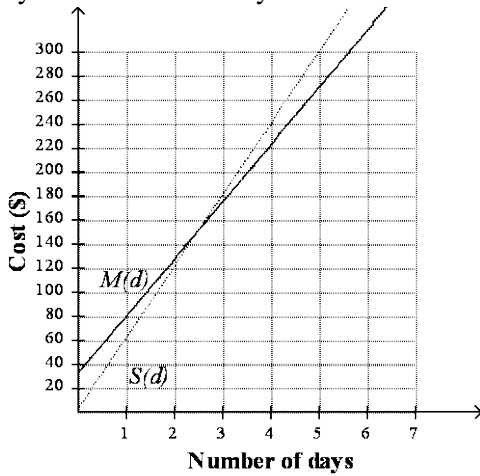
14. The Tome family is renting a car for a few days. Meinke Rentals charges \$48 per day, plus a fixed cleaning fee of \$30. The function $M(d) = 48d + 30$ represents the cost to rent a car from Meinke Rentals for d days. SmartRent charges \$60 per day. The function $S(d) = 60d$ represents the cost to rent a car from SmartRent for d days. Graph M and S on the same coordinate plane. Describe the transformations from the graph of M to the graph of S .

a.



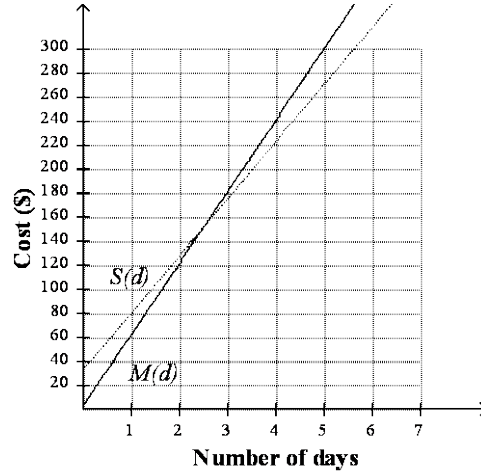
A vertical shift down 30 units, followed by a vertical stretch by a factor of 1.25.

b.



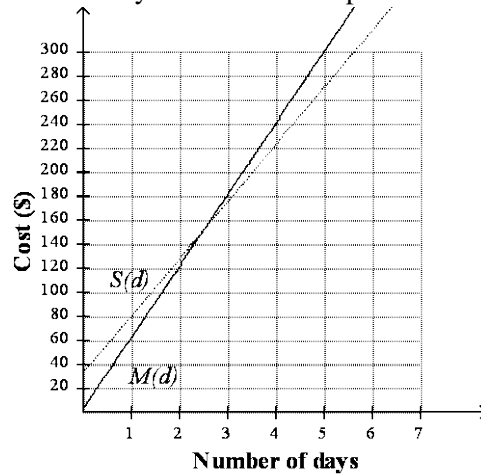
A vertical stretch by a factor of 1.25, followed by a vertical shift down 30 units.

c.



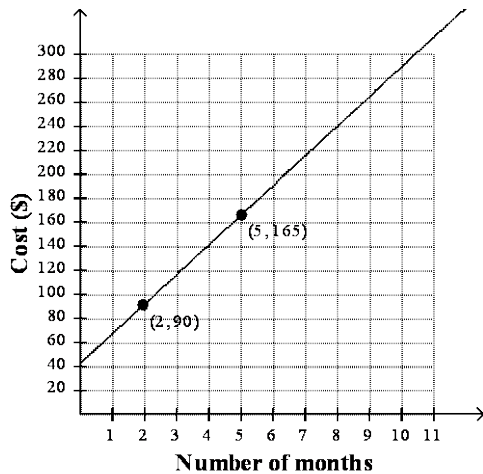
A vertical shrink by a factor of 0.8, followed by a vertical shift up 24 units.

d.

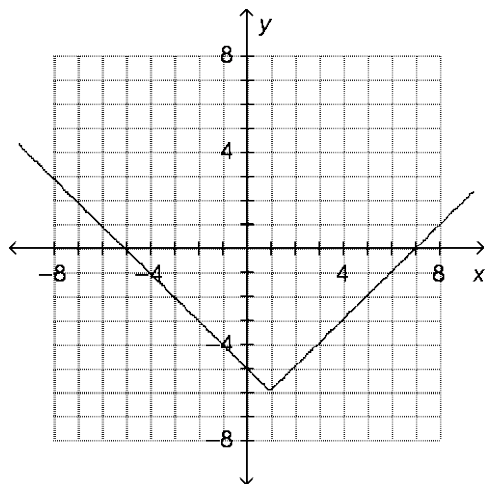


A vertical shift up 24 units, followed by a vertical shrink by a factor of 0.8.

15. The pressure in a car tire is given by $p(x) = 30 - x$ where p is pressure in psi and x is the number of months since the tire was filled. Describe what this function represents.
- The initial tire pressure is 30 psi, and it goes down by 1 psi each month.
 - The initial tire pressure is 30 psi, and it increases by 1 psi each month.
 - The initial tire pressure is 1 psi, and it increases by 30 psi each month.
 - The initial tire pressure is 1 psi, and it goes down by 30 psi each month.
16. The graph shows membership costs at a gym. What is the cost per month?



17. Describe the effect of the transformation $(x, y) \rightarrow (x, 9y)$.
- vertical translation of 9 units
 - horizontal translation of 9 units
 - vertical stretch with reflection
 - vertical stretch without reflection
18. Let $g(x)$ be a vertical shift of $f(x) = -x$ down 8 units followed by a vertical shrink by a factor of $\frac{1}{2}$. Write the rule for $g(x)$.
- $g(x) = -2x - 8$
 - $g(x) = -\frac{1}{2}x - 8$
 - $g(x) = -\frac{1}{2}x - 4$
 - $g(x) = -2x - 16$
19. What must be done to the graph of $f(x) = |x|$ to obtain the graph of the function $g(x) = \frac{2}{3}|x + 6| - 8$?
- The graph of f is shifted left 6 units, horizontally shrunk by a factor of $\frac{2}{3}$, and shifted down 8 units.
 - The graph of f is shifted right 6 units, vertically shrunk by a factor of $\frac{2}{3}$, and shifted down 8 units.
 - The graph of f is shifted left 6 units, vertically shrunk by a factor of $\frac{2}{3}$, and shifted down 8 units.
 - The graph of f is shifted left 6 units, vertically shrunk by a factor of $\frac{2}{3}$, and shifted up 8 units.
20. What is the vertex of the graph?



- a. $(-5, 0)$
- b. $(0, -5)$

- c. $(1, -6)$
- d. $(7, 0)$

- A: 2.5 is not an integer, so it is not in the domain of f .
 $f(2.5)$ does not represent an element of the range of f .
- B: -2 is an integer and it is greater than -8 , so it is in the domain of f .
 $f(-2)$ is the element of the range assigned to -2 .
- C: -8 is an integer, but it is not greater than -8 , so it is not in the domain of f .
 $f(-8)$ does not represent an element of the range of f .
- D: 4 is an integer and it is greater than -8 , so it is in the domain of f .
 $f(4)$ is the element of the range assigned to 4.
- E: $\frac{1}{5}$ is not an integer, so it is not in the domain of f .
 $f\left(\frac{1}{5}\right)$ does not represent an element of the range of f .
- F: 0 is an integer and it is greater than -8 , so it is in the domain of f .
 $f(0)$ is the element of the range assigned to 0.
- G: 8 is an integer and it is greater than -8 , so it is in the domain of f .
 $f(8)$ is the element of the range assigned to 8.
- H: -12 is an integer, but it is not greater than -8 , so it is not in the domain of f .
 $f(-12)$ does not represent an element of the range of f .

	Feedback
Correct	That's correct!
Incorrect	A function assigns each element of its domain to exactly one element of its range.

PTS: 2 NAT: NT.CCSS.MTH.10.9-12.F.IF.1
 KEY: function | domain | range | function values DOK: DOK 1
 NOT: Sec 3.3

11. ANS:

The domain of f is $\left\{\frac{2}{7}, 7, 9.7, 14, 21\right\}$.

Since the range is $\left\{f\left(\frac{2}{7}\right), f(7), f(9.7), f(14), f(21)\right\}$, and each range value is associated with only one domain value, the domain must contain only the values of x being mapped to each of the range values. So, the domain contains $\frac{2}{7}, 7, 9.7, 14,$ and 21 .

Rubric

1 point for the domain;
 2 points for explanation

PTS: 3 NAT: NT.CCSS.MTH.10.9-12.F.IF.1 | NT.CCSS.MTH.10.K-12.MP.3
 KEY: function | domain | range DOK: DOK 2 NOT: Sec 3.3

12. ANS: D PTS: 1 REF: 10b53942-4683-11df-9c7d-001185f0d2ea
 OBJ: Graphing Linear Equations by Using Intercepts NAT: NT.CCSS.MTH.10.9-12.F.IF.7.a
 STA: PA.PAAS.MTH.02.9-11.2.8.11.K | PA.PAAA.MTH.07.11.M11.D.2.1.2
 LOC: MTH.C.10.07.02.03.008 TOP: Using Intercepts

KEY: linear equation | graphing | x-intercept | y-intercept | intercepts

DOK: DOK 1 NOT: Sec 3.4

13. ANS: C PTS: 1 REF: 106db27a-4683-11df-9c7d-001185f0d2ea
OBJ: Graphing Functions
NAT: NT.CCSS.MTH.10.9-12.A.REI.10 | NT.CCSS.MTH.10.9-12.F.IF.2
STA: PA.PAAS.MTH.02.9-11.2.8.11.Q | PA.PAAS.MTH.02.9-11.2.8.11.R | PA.PAAA.MTH.07.11.M11.D.1.1.1
| PA.PAAA.MTH.07.11.M11.D.2.1.2 LOC: MTH.C.10.07.01.01.003
TOP: Graphing Functions KEY: graph | function
DOK: DOK 2 NOT: Sec 3.5
14. ANS: A PTS: 1 REF: 14787272-4683-11df-9c7d-001185f0d2ea
OBJ: Application NAT: NT.CCSS.MTH.10.9-12.A.CED.2 | NT.CCSS.MTH.10.9-12.F.BF.3
TOP: Transforming Linear Functions KEY: transform linear functions
DOK: DOK 2 NOT: Sec 3.5 and 3.6
15. ANS: A PTS: 1 NAT: NT.CCSS.MTH.10.9-12.F.LE.5
KEY: linear | function | parameter DOK: DOK 1 NOT: Sec 3.5
16. ANS:
\$25

PTS: 1 NAT: NT.CCSS.MTH.10.9-12.F.IF.4 DOK: DOK 1
NOT: Sec 3.5

17. ANS: D PTS: 1 REF: 08e9d710-1a76-11df-b9de-001e33aa91d2
NAT: NT.CCSS.MTH.10.9-12.F.BF.3 DOK: DOK 2 NOT: Sec 3.6
18. ANS: C PTS: 1 REF: 14784b62-4683-11df-9c7d-001185f0d2ea
OBJ: Combining Transformations of Linear Functions
NAT: NT.CCSS.MTH.10.9-12.A.CED.2 | NT.CCSS.MTH.10.9-12.F.BF.3
LOC: MTH.C.10.07.16.05.003 TOP: Transforming Linear Functions
KEY: transform linear functions | shift | translate | stretch DOK: DOK 2
NOT: Sec 3.6
19. ANS: C
Follow the order of operations to apply the transformations. First, notice that 6 is being added to x inside the absolute value bars. So, the graph of f is shifted left 6 units. Now, notice that the absolute value expression is being multiplied by $\frac{2}{3}$. So, the graph of f is being vertically shrunk by a factor of $\frac{2}{3}$. Finally, 8 is being subtracted from the first term of f . So, the graph of f is being shifted down 8 units.

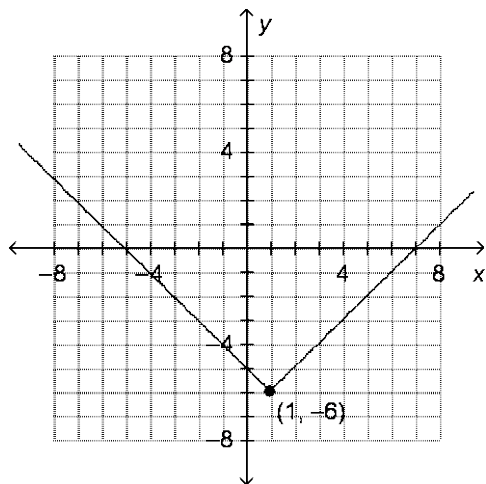
	Feedback
A	Recall that a horizontal shrink occurs when x is multiplied by a constant k , where $0 < k < 1$, before any horizontal shifts occur.
B	In horizontal shifts of the form $f(x + k)$, where k is a constant, the graph is moved in the opposite direction of the sign of k .
C	That's correct!
D	In vertical shifts of the form $f(x) + k$, where k is a constant, the graph is moved in the same direction of the sign of k .

PTS: 1 NAT: NT.CCSS.MTH.10.9-12.F.BF.3

KEY: absolute value function | vertical stretch | horizontal shifts | vertical shifts | transformations

DOK: DOK 1 NOT: Sec 3.7

20. ANS: C



The vertex is $(-2, -4)$.

	Feedback
A	This is one of the points where the function intersects the x -axis.
B	This is the point where the function intersects the y -axis.
C	That's correct!
D	This is one of the points where the function intersects the x -axis.

PTS: 1

NAT: NT.CCSS.MTH.10.9-12.F.IF.7.b*

KEY: absolute value function | graph of a function | function | vertex

DOK: DOK 1

NOT: Sec 3.7