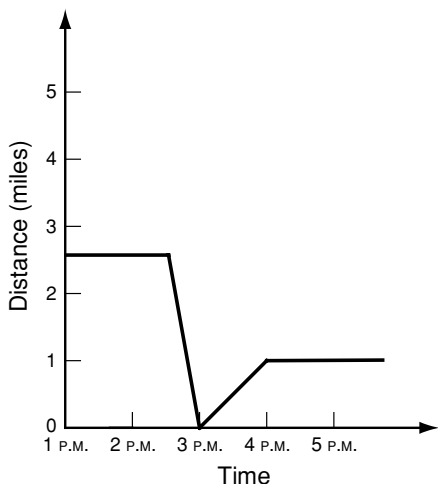


CHAPTER 9 **Chapter Test**
Form A

Select the best answer.

1. The graph below shows how far Andrea was from her home in miles from 1 P.M. to 5 P.M. Based on the graph, which statement is true?



- A Andrea was at home at 3 P.M.
 B Andrea was not at home at 3 P.M.
2. Which words could be represented by the function $g(s) = 3s$?
- A A balloon rises 1 foot per second.
 B A balloon rises 3 feet per second.
3. Which function could represent the data in the table below?

x	-5	0	2	5
$f(x)$	-2	3	5	8

- A $f(x) = -2$
 B $f(x) = x - 3$
 C $f(x) = x + 3$
 D $f(x) = 2x + 1$
4. Evaluate $f(x) = \begin{cases} 2x & \text{if } x \leq 0 \\ x - 2 & \text{if } x > 0 \end{cases}$ at $x = 0$.
- A $f(0) = -2$
 B $f(0) = 0$

5. The cost to deliver a package that weighs less than or equal to 5 pounds is \$2.00. If a package weighs greater than 5 pounds and less than or equal to 10 pounds, the cost is \$10.00. For packages heavier than 10 pounds, the cost is \$20.00. Which function best represents the cost of shipping a package?

A $c(p) = \begin{cases} 0 & \text{if } 0 \leq p \leq 5 \\ 5 & \text{if } 5 < t \leq 10 \\ 10 & \text{if } t > 10 \end{cases}$
 B $c(p) = \begin{cases} 2 & \text{if } 0 \leq p \leq 5 \\ 10 & \text{if } 5 < t \leq 10 \end{cases}$
 C $c(p) = \begin{cases} 2 & \text{if } 0 \leq p < 5 \\ 10 & \text{if } 5 \leq t < 10 \\ 20 & \text{if } t \geq 10 \end{cases}$
 D $c(p) = \begin{cases} 2 & \text{if } 0 \leq p \leq 5 \\ 10 & \text{if } 5 < t \leq 10 \\ 20 & \text{if } t > 10 \end{cases}$

6. Given $f(x) = \begin{cases} 3x & \text{if } x > 0 \\ x - 2 & \text{if } x \leq 0 \end{cases}$, which is the rule for $g(x)$, a vertical translation of $f(x)$ 4 units down?

A $g(x) = \begin{cases} 3x - 12 & \text{if } x > 0 \\ x - 6 & \text{if } x \leq 0 \end{cases}$
 B $g(x) = \begin{cases} 3x - 4 & \text{if } x > -4 \\ x - 6 & \text{if } x \leq -4 \end{cases}$
 C $g(x) = \begin{cases} 3x - 4 & \text{if } x > 0 \\ x - 6 & \text{if } x \leq 0 \end{cases}$
 D $g(x) = \begin{cases} 3x + 4 & \text{if } x > 0 \\ x - 2 & \text{if } x \leq 0 \end{cases}$

7. $f(x) = 3x + 6$ and $g(x) = \frac{1}{2}f(x)$. What is the y -intercept of $g(x)$?

A (0, 3)
 B (0, 12)

CHAPTER
9 **Chapter Test**
Form A continued

8. $f(x) = \begin{cases} x - 7 & \text{if } x > 0 \\ 2x & \text{if } x \leq 0 \end{cases}$ and $g(x) = f(3x)$. What is $g(x)$?
- A** $g(x) = \begin{cases} x - 4 & \text{if } x > 0 \\ 2x + 3 & \text{if } x \leq 0 \end{cases}$
- B** $g(x) = \begin{cases} 3x - 21 & \text{if } x > 0 \\ 6x & \text{if } x \leq 0 \end{cases}$
- C** $g(x) = \begin{cases} 3x - 7 & \text{if } x > 0 \\ 6x & \text{if } x \leq 0 \end{cases}$
- D** $g(x) = \begin{cases} 3x & \text{if } x > 0 \\ 3x & \text{if } x \leq 0 \end{cases}$
9. Given $f(x) = 5x - 3$ and $g(x) = 6x + 2$, find $(f + g)(x)$.
- A** $11x - 1$ **B** $11x + 5$
10. Given $f(x) = 2x + 5$ and $g(x) = 3x - 4$, find $(gf)(x)$.
- A** $5x + 1$
- B** $6x^2 - 20$
- C** $6x^2 + 7x - 20$
- D** $6x^2 + 23x + 20$
11. Given $f(x) = x - 3$ and $g(x) = 4x$, find $g(f(6))$.
- A** 3 **C** 21
- B** 12 **D** 24
12. Given $f(x) = 3x - 6$ and $g(x) = 5x$, find $g(f(x))$.
- A** $15x - 6$ **B** $15x - 30$
13. Which is the inverse of $f(x) = x - 3$?
- A** $y = \frac{1}{x - 3}$ **C** $y = -x + 3$
- B** $y = -x - 3$ **D** $y = x + 3$

14. Use composition to determine if $f(x) = 3x$ and $g(x) = -3x$ are inverses.
- A** No, they are not inverses.
- B** Yes, they are inverses.

Use constant differences or ratios to determine which parent function would best model the given data set.

15.

x	2	4	6	8	10	12
y	5	10	15	20	25	30

- A** exponential **C** quadratic
- B** linear **D** square root

16.

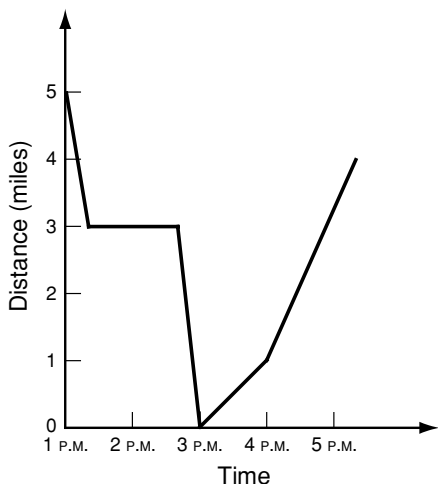
x	-8	-4	0	4	8	16
y	0	1	3	6	10	15

- A** exponential **C** quadratic
- B** linear **D** square root

CHAPTER 9 **Chapter Test**
Form B

Select the best answer.

1. The graph below shows how far Lisa was from her home in miles from 1 P.M. to 5 P.M. Based on the graph, which statement is true?



- A** At 2 P.M., Lisa was getting closer to home.
B Between 4 and 5 P.M., Lisa was getting closer to home.
C Lisa was at home at 1 P.M.
D Lisa was at home at 3 P.M.
2. Which words could be represented by the function $h(t) = 100 + 20t$?
- F** John has \$20 in his bank account. He plans to deposit \$20 each month.
G John has \$20 in his bank account. He plans to deposit \$100 each month.
H John has \$100 in his bank account. He plans to deposit \$20 each month.
J John has \$100 in his bank account. He plans to withdraw \$20 each month.

3. Which function could represent the data in the table below?

s	-10	-4	0	7
t	-200	-80	0	140

- A** $s(t) = 20s$ **C** $t(s) = 20s$
B $s(t) = 20t$ **D** $t(s) = 20t$
4. Evaluate $f(x) = \begin{cases} 2x & \text{if } x \leq 0 \\ x^2 & \text{if } 0 < x \leq 1 \\ x - 2 & \text{if } x > 1 \end{cases}$ at $x = 1$.
- F** $f(1) = 1$ **H** $f(1) = 6$
G $f(1) = 3$ **J** $f(1) = 9$

5. A car is driven 30 mph for 2 hours, 55 mph for the next 5 hours, and 20 mph for the next hour. Which function best represents the distance the car traveled?

- A** $d(t) = \begin{cases} 30 & \text{if } 0 \leq t \leq 2 \\ 55 & \text{if } 2 < t \leq 7 \\ 20 & \text{if } 7 < t \leq 8 \end{cases}$
B $d(t) = \begin{cases} 30t & \text{if } 0 \leq t \leq 2 \\ 55t & \text{if } 2 < t \leq 7 \\ 20t & \text{if } 7 < t \leq 8 \end{cases}$
C $d(t) = \begin{cases} 30t & \text{if } 0 \leq t \leq 2 \\ 55t - 50 & \text{if } 2 < t \leq 7 \end{cases}$
D $d(t) = \begin{cases} 30t & \text{if } 0 \leq t \leq 2 \\ 55t - 50 & \text{if } 2 < t \leq 7 \\ 20t + 195 & \text{if } 7 < t \leq 8 \end{cases}$

6. Given $f(x) = \begin{cases} x + 5 & \text{if } x > 0 \\ 3x + 5 & \text{if } x \leq 0 \end{cases}$, which is the rule for $g(x)$, a horizontal translation of $f(x)$ 3 units left?

- F** $g(x) = \begin{cases} x + 2 & \text{if } x > 3 \\ 3x - 4 & \text{if } x \leq 3 \end{cases}$
G $g(x) = \begin{cases} x + 8 & \text{if } x > -3 \\ 3x + 8 & \text{if } x \leq -3 \end{cases}$
H $g(x) = \begin{cases} x + 8 & \text{if } x > -3 \\ 3x + 14 & \text{if } x \leq -3 \end{cases}$
J $g(x) = \begin{cases} x + 8 & \text{if } x > 0 \\ 3x + 14 & \text{if } x \leq 0 \end{cases}$

CHAPTER 9 **Chapter Test**
Form B continued

7. $f(x) = 12x - 6$ and $g(x) = 2f(x)$. What is the y -intercept of $g(x)$?
- A** $(0, -12)$ **C** $(0, 12)$
B $(0, -6)$ **D** $(\frac{1}{2}, 0)$
8. $f(x) = \begin{cases} 3x + 9 & \text{if } x > 6 \\ -12x - 15 & \text{if } x \leq 6 \end{cases}$ and $g(x) = f(\frac{1}{3}x)$. What is $g(x)$?
- F** $g(x) = \begin{cases} x + 9 & \text{if } x > 2 \\ -4x - 15 & \text{if } x \leq 2 \end{cases}$
G $g(x) = \begin{cases} x + 9 & \text{if } x > 6 \\ -4x - 15 & \text{if } x \leq 6 \end{cases}$
H $g(x) = \begin{cases} x + 3 & \text{if } x > 2 \\ -4x - 15 & \text{if } x \leq 2 \end{cases}$
J $g(x) = \begin{cases} x + 3 & \text{if } x > 6 \\ -4x - 5 & \text{if } x \leq 6 \end{cases}$
9. Given $f(x) = 2x^2 - 3x + 2$ and $g(x) = 7x + 4$, find $(f + g)(x)$.
- A** $2x^2 - 4x + 6$ **C** $2x^2 + 10x + 6$
B $2x^2 + 4x + 6$ **D** $9x^2 + x + 2$
10. Given $f(x) = 3x^2 + x - 1$ and $g(x) = 4x + 5$, find $(gf)(x)$.
- F** $3x^2 + 5x + 4$
G $12x^3 + 4x^2 - 4x$
H $12x^3 + 19x^2 + x - 5$
J $12x^3 + 19x^2 + 9x - 5$
11. Given $f(x) = 5x - 3$ and $g(x) = x^2$, find $g(f(2))$.
- A** 7 **C** 32
B 17 **D** 49
12. Given $f(x) = 4x + 3$ and $g(x) = \frac{1}{4 - x}$, find $g(f(x))$.
- F** $\frac{1}{1 - 4x}$
G $\frac{-3x + 16}{4 - x}$
H $\frac{4x + 3}{4 - x}$
J $\frac{-4x^2 + 13x + 13}{4 - x}$

13. Which is the inverse of $f(x) = \frac{(x + 7)^2}{6}$?
- A** $y = -7 \pm \sqrt{6x}$
B $y = -7 \pm 6\sqrt{x}$
C $y = -\frac{(x + 7)^2}{6}$
D $y = 6(x + 7)^{-2}$
14. What are the domain and range of the inverse of $y = \frac{1}{\sqrt{x}} + 1$?
- F** $D: \mathbb{R}; R: y \geq 0$
G $D: \mathbb{R}; R: y > 0$
H $D: x \geq 0; R: \mathbb{R}$
J $D: x \neq 1; R: y > 0$

Use constant differences or ratios to determine which parent function would best model the given data set.

15.

x	3	7	11	15	19	23
y	64	96	144	216	324	486

- A** exponential
B linear
C quadratic
D square root

16.

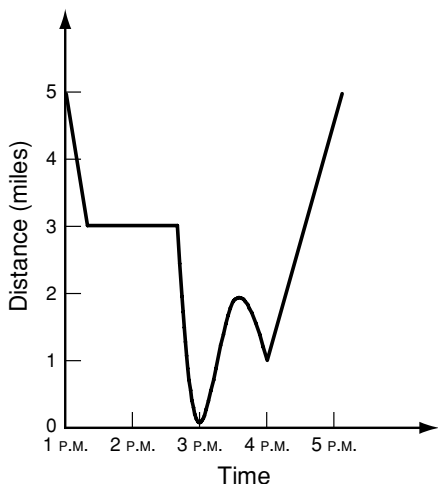
x	0	5	10	15	20	25
y	3.4	4.1	6.0	9.1	13.4	18.9

- F** exponential
G linear
H quadratic
J square root

CHAPTER 9 **Chapter Test**
Form C

Select the best answer.

1. The graph below shows how far Carol was from her home in miles from 1 P.M. to 5 P.M. Based on the graph, which statement could be true?



- A** Between 1 and 2 P.M., Carol was less than 1 mile from home.
B At 1 P.M., Carol was at home.
C At 2 P.M., Carol was not moving.
D At 4 P.M., Carol began walking home.
2. Which situation could be represented by the function $f(x) = 25 - x^2$?
- F** A feather, 25 feet in the air, drops 1 foot per second.
G A population begins at 25 and increases exponentially over time.
H A 5 inch by 5 inch piece of metal has a x inch by x inch square removed from it.
J John has 25 gallons of paint. Each day he uses 2% of the paint.
3. Which function could represent the data in the table below?

s	-1	0	1	3
t	0	1	2	28

A $s(t) = (t - 1)^{\frac{1}{3}}$ **C** $t(s) = s + 1$
B $s(t) = t^{\frac{1}{3}} - 1$ **D** $t(s) = (t - 1)^{\frac{1}{3}}$

4. Evaluate $f(x) = \begin{cases} \cos x & \text{if } x \leq 0 \\ x^3 & \text{if } 0 < x \leq 1 \\ e^x & \text{if } x > 1 \end{cases}$ at $x = \ln 1$.

F $f(\ln 1) = -1$ **H** $f(\ln 1) = 1$
G $f(\ln 1) = 0$ **J** $f(\ln 1) = e^3$

5. The piecewise function

$$f(x) = \begin{cases} \frac{1}{4}x + \frac{5}{4} & \text{if } x \leq a \\ 2x + 3 & \text{if } a < x \leq b \\ -3x + 18 & \text{if } b < x \end{cases} \text{ is}$$

continuous. What are a and b ?

A $a = -5, b = 6$
B $a = -1, b = 3$
C $a = 1, b = 9$
D $a = \frac{5}{4}, b = 18$

6. Given $f(x) = \begin{cases} x^2 + 6 & \text{if } x > 0 \\ 5x + 6 & \text{if } x \leq 0 \end{cases}$, which is the rule for $g(x)$, a vertical stretch of $f(x)$ by a factor of 4, followed by a vertical translation 7 units up?

F $g(x) = \begin{cases} x^2 + 13 & \text{if } x > 0 \\ 5x + 13 & \text{if } x \leq 0 \end{cases}$
G $g(x) = \begin{cases} 4x^2 + 7 & \text{if } x > 0 \\ 20x + 7 & \text{if } x \leq 0 \end{cases}$
H $g(x) = \begin{cases} 4x^2 + 17 & \text{if } x > 0 \\ 20x + 17 & \text{if } x \leq 0 \end{cases}$
J $g(x) = \begin{cases} 4x^2 + 31 & \text{if } x > 0 \\ 20x + 31 & \text{if } x \leq 0 \end{cases}$

7. $f(x) = 7x - 14$. $g(x) = af(x)$, the x -intercept of $g(x)$ is $(2, 0)$, and the y -intercept of $g(x)$ is $(0, -70)$. What is a ?

A $a = -56$ **C** $a = \frac{7}{2}$
B $a = 1$ **D** $a = 5$

CHAPTER

Chapter Test

9 **Level C** continued

8. $f(x) = \begin{cases} 2x - 7 & \text{if } x > 6 \\ x^2 - 1 & \text{if } x \leq 6 \end{cases}$ and $g(x) =$

$f(x + 3)$. What is $g(x)$?

F $g(x) = \begin{cases} 2x - 7 & \text{if } x > 9 \\ x^2 - 1 & \text{if } x \leq 9 \end{cases}$

G $g(x) = \begin{cases} 2x - 1 & \text{if } x > 6 \\ x^2 + 6x + 8 & \text{if } x \leq 6 \end{cases}$

H $g(x) = \begin{cases} 2x - 1 & \text{if } x > 9 \\ x^2 + 6x + 8 & \text{if } x \leq 9 \end{cases}$

J $g(x) = \begin{cases} 2x - 4 & \text{if } x > 6 \\ x^2 + 2 & \text{if } x \leq 6 \end{cases}$

9. Given $f(x) = \frac{1}{x+2}$ and $g(x) = \frac{1}{2x-7}$,

find $(f - g)(x)$.

A $\frac{1}{2x^2 - 3x - 14}$

C $\frac{2x - 7}{x + 2}$

B $\frac{x - 9}{2x^2 - 3x - 14}$

D $\frac{3x - 5}{2x^2 - 3x - 14}$

10. Given $f(x) = 3x^2 + 16x - 12$ and $g(x) = 3x - 2$, find $\left(\frac{f}{g}\right)(x)$.

F $x - 6$

G $x + 6$

H $3x^2 - 13x - 10$

J $3x^2 + \frac{16}{3}x + 6$

11. Given $f(x) = 7x - 2$, $g(x) = x^3$, and $h(x) = x^2 - x$, find $f(g(h(2)))$.

A 8

C 56

B 54

D 132

12. Given $f(x) = \frac{x^2}{2}$, $g(x) = \frac{2}{x}$, and $h(x) = 4x - 3$, find $h(f(g(x)))$.

F $\frac{2}{x^2}$

H $\frac{16 - 48x + 9x^2}{2x^2}$

G $\frac{8 - 3x^2}{x^2}$

J $\frac{16 - 4x^2}{x^4}$

13. Which is the inverse of $y = x^2 + 10x + 25$?

A $y = \frac{1}{x^2 + 10x + 25}$

B $y = -5 \pm \sqrt{x}$

C $y = -x^2 - 10x - 25$

D $y = x - 5$

14. What are the domain and range of the inverse of $f(x) = \ln(x + 2)$?

F D: $x > 0$; R: $y > -2$

G D: $x > 0$; R: $y > 0$

H D: \mathbb{R} ; R: $y > -2$

J D: \mathbb{R} ; R: \mathbb{R}

15. Use constant differences or ratios to determine which parent function would best model the given data set.

x	-31	-24	-17	-10	-3	4
y	$\frac{27}{4}$	$\frac{9}{2}$	3	2	$\frac{4}{3}$	$\frac{8}{9}$

A exponential

B linear

C quadratic

D square root

16. The data in the table below are best modeled by a square root function. What do a and b equal?

x	38.9	47.0	a	71.3	87.5	106.4
y	-6	-1	b	9	14	19

F $a = 8.1, b = 4$

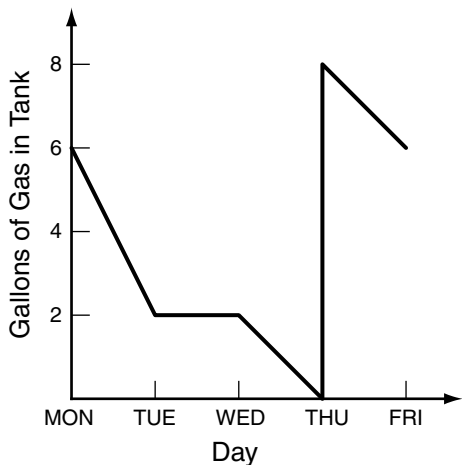
G $a = 13.5, b = 4$

H $a = 55.1, b = 4$

J $a = 57.8, b = 4$

CHAPTER 9 **Chapter Test**
Form A

1. The graph below shows how much gasoline was in a car's gas tank during the course of 5 days. On what day was gas added to the tank?



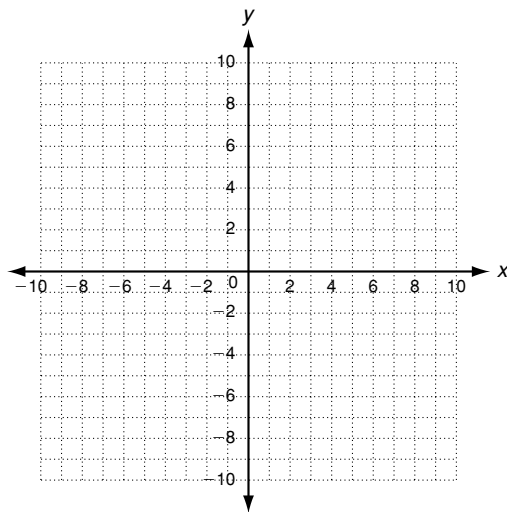
2. Describe a situation that could be represented by the function $d(w) = 7w$.
3. Write a function that could represent the data in the table shown below.

x	-9	0	3	15
$f(x)$	-5	4	7	19

4. Evaluate $f(x) = \begin{cases} 5x & \text{if } x \leq 2 \\ x + 7 & \text{if } x > 2 \end{cases}$ at $x = 2$.

5. Graph the function

$$f(x) = \begin{cases} 2 & \text{if } -\infty < x \leq -2 \\ \frac{1}{2}x + 3 & \text{if } -2 < x < \infty \end{cases}$$



6. Given $f(x) = \begin{cases} x & \text{if } x > 0 \\ 2x & \text{if } x \leq 0 \end{cases}$, write the rule for $g(x)$, a vertical translation of $f(x)$ 3 units up.
7. Given $f(x) = x + 4$ and $g(x) = 2f(x)$, what are the x - and y -intercepts of $g(x)$?
8. Given $f(x) = \begin{cases} x + 3 & \text{if } x < 0 \\ 12x & \text{if } x \geq 0 \end{cases}$ and $g(x) = f(2x)$, write the rule for $g(x)$.
9. Given $f(x) = 3x + 7$ and $g(x) = 5x + 4$, write the rule for $(f + g)(x)$.
10. Given $f(x) = x^2$ and $g(x) = 6x$, write the rule for $(gf)(x)$.

CHAPTER 9 **Chapter Test**
Form A continued

11. Given $f(x) = 3x$ and $g(x) = x - 2$, find $g(f(5))$.

12. Given $f(x) = x + 4$ and $g(x) = 7x$, find $g(f(x))$.

13. Write the inverse of $f(x) = 6x$. Determine whether it is a function, and state its domain and range.

14. Determine by composition if $f(x) = \frac{x}{2}$ and $g(x) = x^2$ are inverses.

Use constant differences or ratios to determine which parent function would best model the given data set.

15.

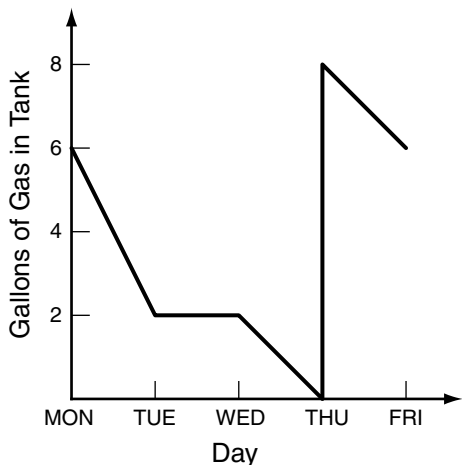
x	1	4	7	10	13	16
y	15	17	19	21	23	25

16.

x	2	3	4	5	6	7
y	5	10	17	26	37	50

CHAPTER
9 **Chapter Test**
Form B

1. Describe a situation that could be reflected in the graph shown below, which shows how much gasoline is in a car's gas tank during the course of 5 days.



2. Describe a situation that could be represented by the function $g(t) = -250 + 5t$.

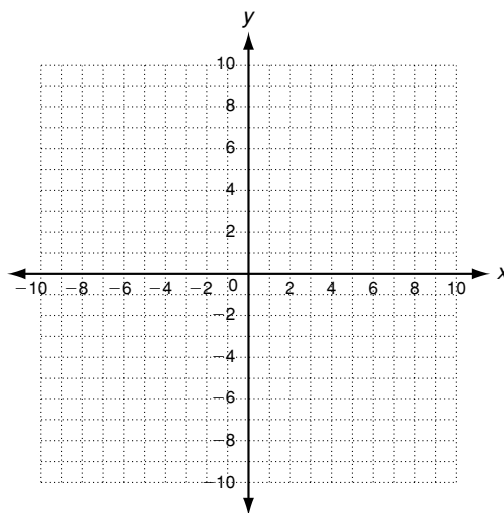
3. Write a function that could represent the data in the table shown below.

t	-9	0	3	15
w	-3	0	1	5

4. Evaluate $f(x) = \begin{cases} 5x & \text{if } x \leq -2 \\ x^3 & \text{if } -2 < x < 2 \\ x + 7 & \text{if } x \geq 2 \end{cases}$ at $x = 2$.

5. Graph the function

$$f(x) = \begin{cases} 2 & \text{if } -\infty < x \leq -2 \\ \frac{1}{2}x + 3 & \text{if } -2 < x \leq 1 \\ -\frac{7}{8}x + \frac{35}{8} & \text{if } 1 < x < \infty \end{cases}$$



6. Given $f(x) = \begin{cases} x - 7 & \text{if } x > 0 \\ 2x - 7 & \text{if } x \leq 0 \end{cases}$, write the rule for $g(x)$, a vertical translation of $f(x)$ 5 units up.

7. Given $f(x) = \frac{1}{3}x + 4$ and $g(x) = 3f(x)$, what are the x - and y -intercepts of $g(x)$?

8. Given $f(x) = \begin{cases} 4x + 3 & \text{if } x < 8 \\ -12x + 16 & \text{if } x \geq 8 \end{cases}$ and $g(x) = f(4x)$, write the rule for $g(x)$.

9. Given $f(x) = 3x^2 + 2x - 5$ and $g(x) = -6x - 2$, write the rule for $(f - g)(x)$.

10. Given $f(x) = 2x^2 - 3x + 4$ and $g(x) = -x + 7$, write the rule for $(gf)(x)$.

CHAPTER 9 **Chapter Test**
Form B continued

11. Given $f(x) = x^2$ and $g(x) = 8x - 15$, find $g(f(3))$.

12. Given $f(x) = \frac{1}{x+2}$ and $g(x) = 3x + 5$, find $g(f(x))$.

13. Write the inverse of $f(x) = \frac{1}{9}(x - 4)^2$. Determine whether it is a function, and state its domain and range.

14. Determine by composition if $f(x) = -\frac{1}{3}x - 6$ and $g(x) = 3x + 6$ are inverses.

Use constant differences or ratios to determine which parent function would best model the given data set.

15.

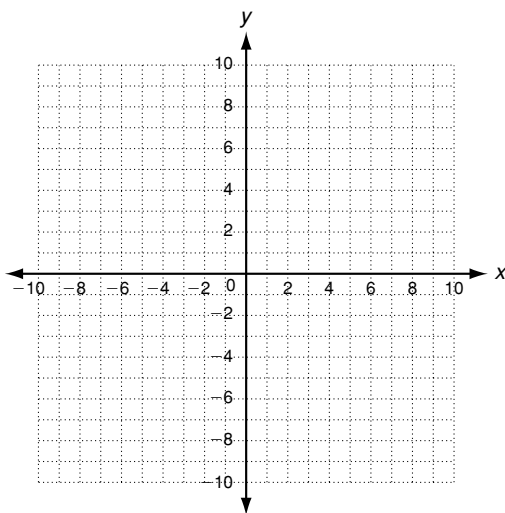
x	1	4	9.1	16.3	25.6	37
y	1	4	7	10	13	16

16.

x	-12	-7	-2	3	8	13
y	37	26	15	4	-7	-18

CHAPTER 9 **Chapter Test**
Form C

1. Draw a graph showing how much gasoline is in a car's gas tank during the course of 5 days if the following is true: The car was driven all day Monday. On Tuesday, the car was not driven. On Wednesday the car was driven until it ran out of gas. On Thursday morning gas was added to the car, and it was driven all day.



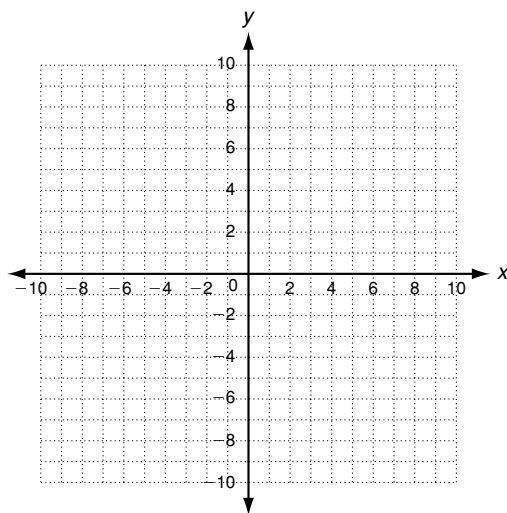
2. Describe a situation that could be represented by the function $f(x) = x(2x)(5x)$.
- _____
3. Write a function that could represent the data in the table shown below.

<i>t</i>	-3	0	3	7
<i>w</i>	10	1	10	50

4. Evaluate $f(x) = \begin{cases} 2x & \text{if } x \leq -3 \\ x^2 + 2 & \text{if } -3 < x < 3 \\ x + 2 & \text{if } x \geq 3 \end{cases}$ at $x = \sqrt{2}$.
- _____

5. Graph the function

$$f(x) = \begin{cases} 2 & \text{if } -\infty < x \leq -2 \\ x^2 - 2 & \text{if } -2 < x \leq 1 \\ \frac{1}{2}x - \frac{3}{2} & \text{if } 1 < x < \infty \end{cases}$$



6. Given $f(x) = \begin{cases} x^2 + 8 & \text{if } x > 0 \\ x^4 + 8 & \text{if } x \leq 0 \end{cases}$, write the rule for $g(x)$, a vertical stretch of $f(x)$ by a factor of 3, followed by a reflection across the x -axis.
- _____
7. $f(x) = 6x + 5$. $g(x) = af(x)$, the x -intercept $g(x)$ is $(-\frac{5}{6}, 0)$, and the y -intercept of $g(x)$ is $(0, 25)$, What is a ?
- _____
8. Given $f(x) = \begin{cases} 4x + 3 & \text{if } x < 8 \\ x^2 & \text{if } x \geq 8 \end{cases}$ and $g(x) = f(x + 2)$, write the rule for $g(x)$.
- _____
9. Given $f(x) = \frac{1}{x+3}$ and $g(x) = \frac{1}{x+2}$, write the rule for $(f + g)(x)$.
- _____

CHAPTER 9 **Chapter Test**
Form C continued

10. Given $f(x) = x^2 + 3x - 10$ and $g(x) = x + 5$, write the rule for $\left(\frac{f}{g}\right)(x)$.

11. Given $f(x) = x^2$, $g(x) = 8x - 10$, and $h(x) = 7x - 19$, find $f(g(h(3)))$.

12. Given $f(x) = \frac{1}{x+2}$, $g(x) = 3x + 5$, and $h(x) = x^2$, find $h(f(g(x)))$.

13. Write the inverse of $f(x) = e^{x-3}$. Determine whether it is a function, and state its domain and range.

14. Determine by composition if $f(x) = \frac{1}{x+2}$ and $g(x) = \frac{1-2x}{x}$ are inverses.

15. Use constant differences or ratios to determine which parent function would best model the given data set.

x	-7	2	11	20	29	38
y	5	15	45	135	405	1215

16. The data in the table below are best modeled by a quadratic function. What do a and b equal?

x	-12	-8	a	0	4	8
y	-32	-27	b	-5	12	33

Answer Key continued

- 21. D
- 22. H
- 23. A
- 24. F
- 25. A
- 26. H
- 27. C
- 28. J
- 29. A
- 30. F
- 31. C
- 32. G
- 33. C
- 34. J
- 35. A
- 36. F
- 37. A

CHAPTER 9

Section Quiz: Section A

- 1. C
- 2. H
- 3. B
- 4. H
- 5. B
- 6. J

Section Quiz: Section B

- 1. D
- 2. J
- 3. D
- 4. F
- 5. D
- 6. F

- 7. A
- 8. H
- 9. B
- 10. J

Chapter Test Form A

- 1. A
- 2. B
- 3. C
- 4. B
- 5. D
- 6. C
- 7. A
- 8. C
- 9. A
- 10. C
- 11. B
- 12. B
- 13. D
- 14. A
- 15. B
- 16. C

Chapter Test Form B

- 1. D
- 2. H
- 3. C
- 4. J
- 5. D
- 6. H
- 7. A
- 8. G
- 9. B
- 10. H

- 11. D
- 12. F
- 13. A
- 14. G
- 15. A
- 16. H

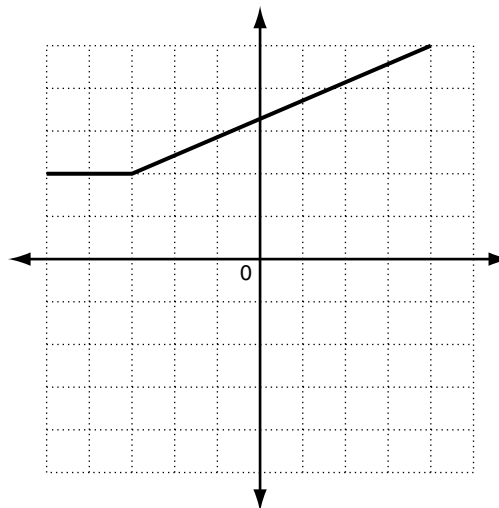
Chapter Test Form C

- 1. C
- 2. H
- 3. A
- 4. H
- 5. B
- 6. J
- 7. D
- 8. G
- 9. B
- 10. G
- 11. B
- 12. G
- 13. B
- 14. H
- 15. A
- 16. J

Chapter Test Form A

- 1. Thursday
- 2. Answers may vary. Sample answer: How many days are there in w weeks?
- 3. $f(x) = x + 4$
- 4. $f(2) = 10$

5.

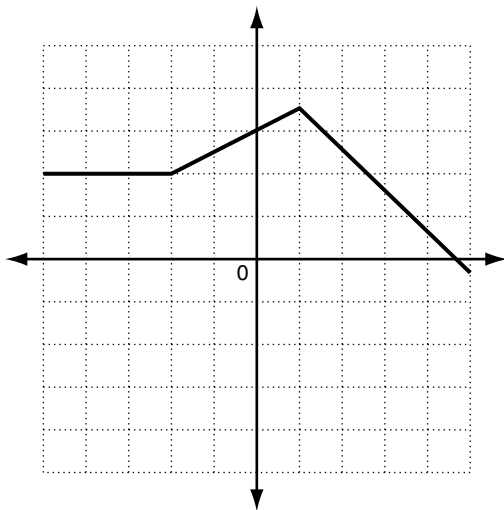


- 6. $g(x) = \begin{cases} x + 3 & \text{if } x > 0 \\ 2x + 3 & \text{if } x \leq 0 \end{cases}$
- 7. x-intercept: -4 ; y-intercept: 8
- 8. $g(x) = \begin{cases} 2x + 3 & \text{if } x < 0 \\ 24x & \text{if } x \geq 0 \end{cases}$
- 9. $(f + g)(x) = 8x + 11$
- 10. $(gf)(x) = 6x^3$
- 11. $g(f(3)) = 13$
- 12. $g(f(x)) = 7x + 28$
- 13. $y = \frac{x}{6}$, it is a function, D: \mathbb{R} ; R: \mathbb{R}
- 14. They are not inverses.
- 15. linear
- 16. quadratic

Chapter Test Form B

- 1. Answers may vary. Sample answer: A car ran out of gas on Thursday, then 8 gallons were added to the tank.
- 2. Answers may vary. Sample answer: A submarine is 250 feet below sea level and rises 5 feet per second.
- 3. $w(t) = \frac{t}{3}$ or $t(w) = 3w$
- 4. $f(2) = 9$

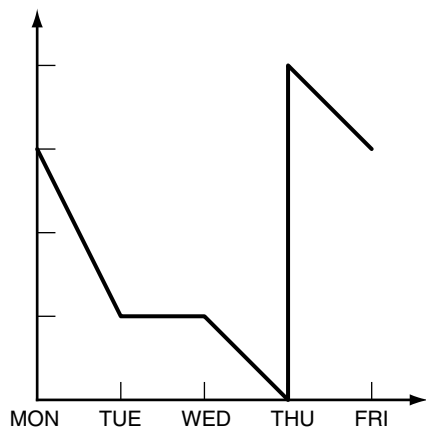
5.



6. $g(x) = \begin{cases} x - 2 & \text{if } x > 0 \\ 2x - 2 & \text{if } x \leq 0 \end{cases}$
7. x-intercept: -12 ; y-intercept: 12
8. $g(x) = \begin{cases} 16x + 3 & \text{if } x < 8 \\ -48x + 16 & \text{if } x \geq 8 \end{cases}$
9. $(f - g)(x) = 3x^2 + 8x - 3$
10. $(gf)(x) = -2x^3 + 17x^2 - 25x + 28$
11. $g(f(3)) = 57$
12. $g(f(x)) = \frac{5x + 13}{x + 2}$
13. $y = \pm 3\sqrt{x} + 4$, it is not a function,
D: $\{x \mid x \geq 0\}$; R: \mathbb{R}
14. They are not inverses.
15. square root
16. linear

Chapter Test Form C

1. Answers may vary. Sample graph:

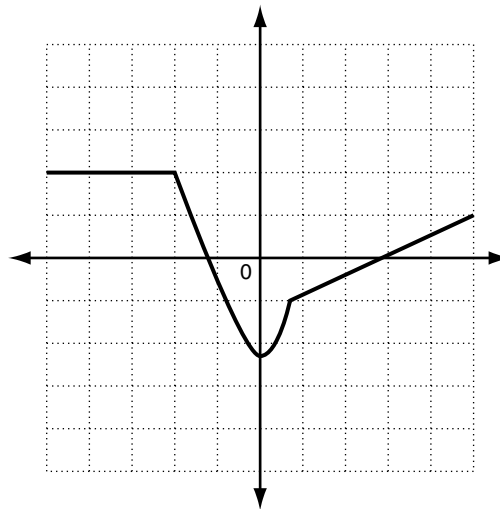


2. Answers may vary. Sample answer: The volume of a box whose length is x , width is twice the length, and height is 5 times the length.

3. $w(t) = t^2 + 1$ or $t(w) = \sqrt{w - 1}$

4. $f(\sqrt{2}) = 4$

5.



6. $g(x) = \begin{cases} -3x^2 - 24 & \text{if } x > 0 \\ -3x^4 - 24 & \text{if } x \leq 0 \end{cases}$

7. $a = 5$

8. $g(x) = \begin{cases} 4x + 11 & \text{if } x < 8 \\ x^2 + 4x + 4 & \text{if } x \geq 8 \end{cases}$

9. $(f + g)(x) = \frac{2x + 5}{(x + 3)(x + 2)}$

10. $\left(\frac{f}{g}\right)(x) = x - 2$

11. $f(g(h(3))) = 36$

12. $h(f(g(x))) = \frac{1}{(3x + 7)^2}$

13. $y = 3 + \ln x$, it is a function,
D: $\{x \mid x > 0\}$; R: \mathbb{R}

14. They are inverses.

15. exponential

16. $a = -4$, $b = -18$

Performance Assessment

1. $f(x) = \frac{3 - x}{2x - 1}$; $x = \frac{3 - y}{2y - 1}$;
 $2xy - x = 3 - y$; $2xy + y = 3 + x$;
 $y(2x + 1) = 3 + x$; $y = f^{-1}(x) = \frac{x + 3}{2x + 1}$