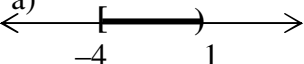



CHAPTER 8, FORM A

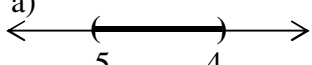
1. $\{a, m\}$
 $\{a, c, g, h, i, m, t\}$

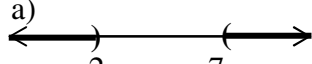
2. $-1, 4$
 3. $0, 4$
 4. $-6, 1$


5. No solution

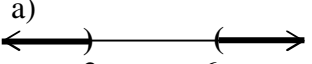
6. a) 
 b) $\{x \mid -4 \leq x < 1\}$
 c) $[-4, 1)$

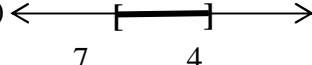
7. a) 
 b) $\{x \mid -2 < x \leq 5\}$
 c) $(-2, 5]$

8. a) 
 b) $\{a \mid -5 < a - 4\}$
 c) $(-5, 4)$

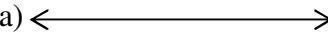
9. a) 
 b) $\{x \mid x < 2 \text{ or } x > 7\}$
 c) $(-\infty, 2) \cup (7, \infty)$


10. a) 
 b) $\{x \mid 1 < x < 3\}$
 c) $(1, 3)$

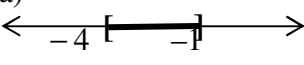
11. a) 
 b) $\{x \mid x < 2 \text{ or } x > 6\}$
 c) $(-\infty, 2) \cup (6, \infty)$

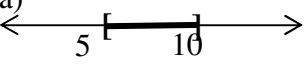
12. a) 

- b) $\{x \mid -7 \leq x \leq 4\}$
 c) $[-7, 4]$

13. a) 
 b) No solution
 c) \emptyset

14. a) 
 b) All real numbers
 c) $(-\infty, \infty)$

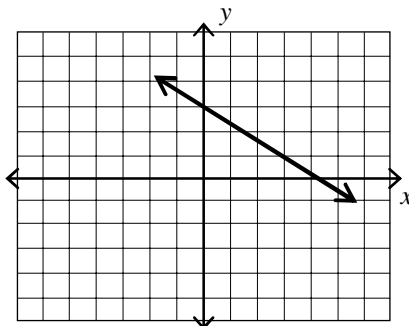
15. a) 
 b) $\{x \mid -4 \leq x \leq -1\}$
 c) $[-4, -1]$

16. a) 
 b) $x \mid 5 \leq x \leq 10$
 c) $[5, 10]$

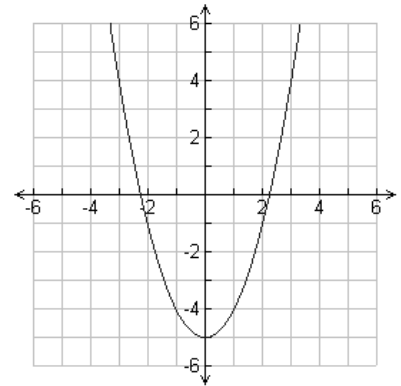
17. Domain: All real numbers
 Range: $\{y \mid y \leq 0\}$
 It is a function.

18. 16

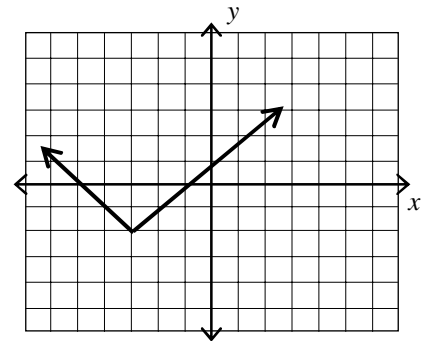
19. $f(x) = -\frac{2}{3}x + 3$



20. $f(x) = x^2 - 5$



21. $f(x) = |x + 3| - 2$



22. a) $5x - 5$
 b) $x - 11$
 c) $6x^2 - 7x - 24$

23. a) $5x^2 + 1$
 b) $-x^2 - 3$
 c) $6x^4 + x^2 - 2$

24. $2x^2 - x - 3$

25. a) $3x - 1$
 b) 11 cm

CHAPTER 8, FORM B

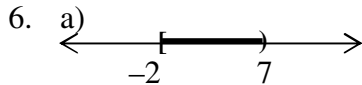
1. $\{e, o\}$
 $\{a, e, i, l, o, u, v, w\}$

2. $-11, 8$

3. $-2, 8$

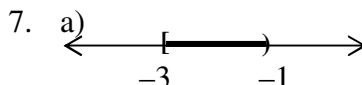
4. $-4, 4$

5. No solution



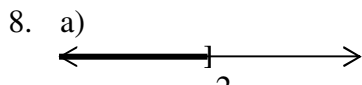
b) $\{x | -2 < x < 7\}$

c) $[-2, 7)$



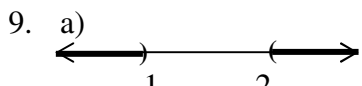
b) $\{x | -3 \leq x < -1\}$

c) $[-3, -1)$



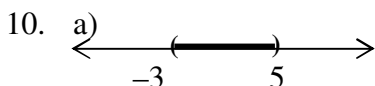
b) $\{a | a \leq -2\}$

c) $(-\infty, -2]$



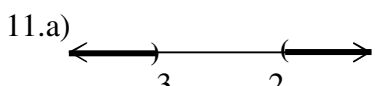
b) $\{x | x < -1 \text{ or } x > 2\}$

c) $(-\infty, -1) \cup (2, \infty)$



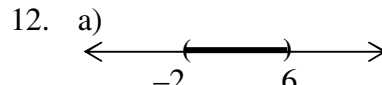
b) $\{y | -3 < y < 5\}$

c) $(-3, 5)$



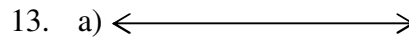
b) $\{x | x \leq -3 \text{ or } x \geq 2\}$

c) $(-\infty, -3] \cup [2, \infty)$



b) $\{x | -2 < x < 6\}$

c) $(-2, 6)$



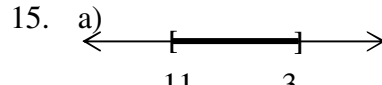
b) No solution

c) \emptyset



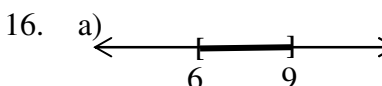
b) All real numbers

c) $(-\infty, \infty)$



b) $\{x | -11 \leq x \leq 3\}$

c) $[-11, 3]$



b) $\{x | 6 \leq x \leq 9\}$

c) $[6, 9]$

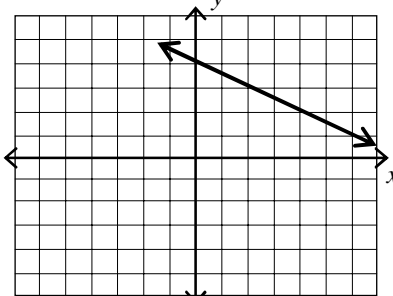
17. Domain: $\{x | x \leq 0\}$

Range: $(-\infty, \infty)$

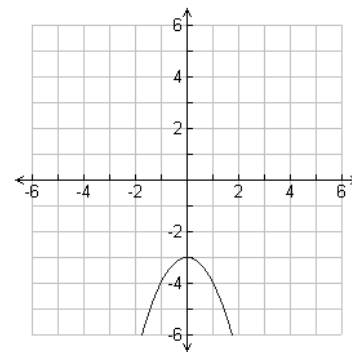
It is not a function.

18. 17

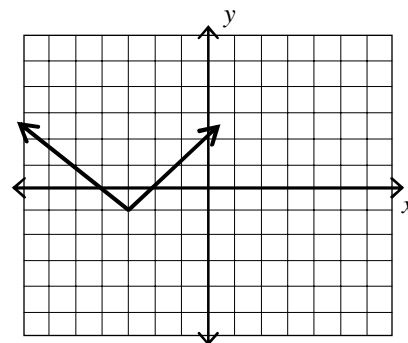
19. $f(x) = -\frac{1}{2}x + 4$



20. $f(x) = -x^2 - 3$



21. $f(x) = |x + 3| - 1$



22. a) $5x - 2$

b) $3x - 8$

c) $4x^2 + 7x - 15$

23. a) $3x^2 - 1$

b) $x^2 - 13$

c) $2x^4 + 5x^2 - 42$

24. $3x^2 - x - 2$

25. a) $2x + 3$

b) 15 cm

CHAPTER 8, FORM C

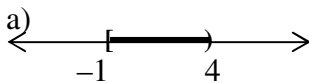
1. $\{a, e\}$
 $\{a, e, f, l, m, s, t\}$

2. $-5, 2$

3. $-\frac{7}{2}, \frac{21}{2}$

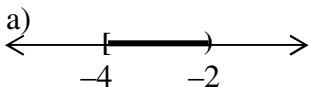
4. $-4, 2$

5. No solution

6. a) 

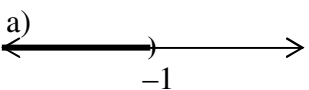
b) $\{x | -1 \leq x < 4\}$

c) $[-1, 4)$

7. a) 

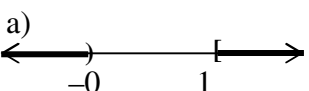
b) $\{x | -4 \leq x < -2\}$

c) $[-4, -2)$

8. a) 


b) $\{a | a < -1 \text{ and } a < 1\}$

c) $(-\infty, -1)$

9. a) 

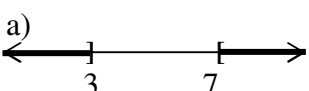
b) $\{x | x < 0 \text{ or } x \geq 1\}$

c) $(-\infty, 0) \cup [1, \infty)$

10. a) 


b) $\{x | -7 < x < 3\}$

c) $(-7, 3)$

11. a) 

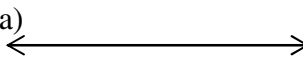
b) $\{a | a \leq 3 \text{ or } a \geq 7\}$

c) $(-\infty, 3] \cup [7, \infty)$

12. a) 

b) $\{x | -8 < x < 4\}$

c) $(-8, 4)$

13. a) 

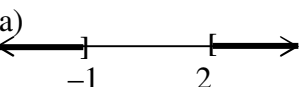
b) No solution

c) \emptyset

14. a) 

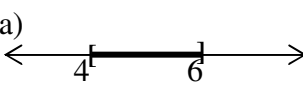
a) All real numbers

b) $(-\infty, \infty)$

15. a) 

b) $\{x | x \leq -1 \text{ or } x \geq 2\}$

c) $(-\infty, -1] \cup [2, \infty)$

16. a) 

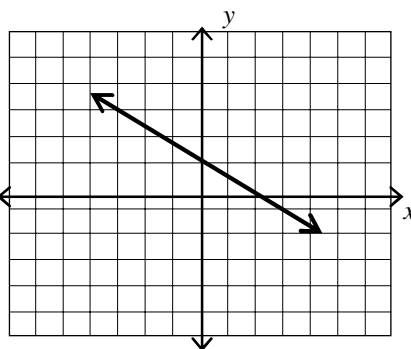
b) $\{x | 4 \leq x \leq 6\}$

c) $[4, 6]$

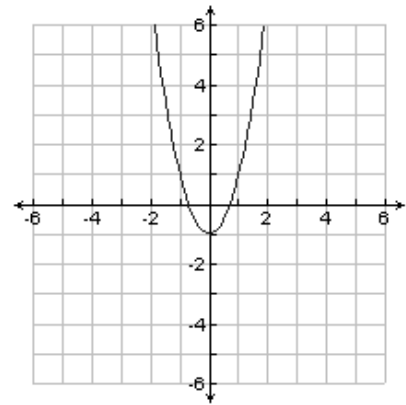
17. Domain: $\{x | x \geq 0\}$
 Range: $(-\infty, \infty)$
 It is not a function.

18. 9

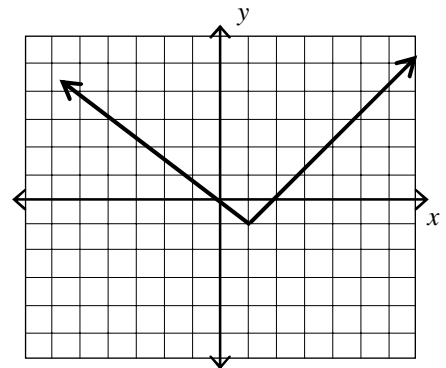
19. $f(x) = -\frac{2}{3}x + 1$



20. $f(x) = 2x^2 - 1$



21. $f(x) = |x - 1| - 1$



22. a) $5x + 1$

b) $x - 5$

c) $6x^2 + 5x - 6$

23. a) $5x^2 - 3$

b) $x^2 - 5$

c) $6x^4 - 5x^2 - 4$

24. $x^2 - 2x - 3$

25. a) $3x - 5$

b) 4 cm

CHAPTER 8, FORM D

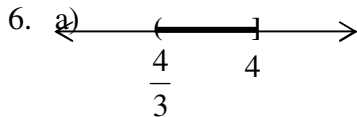
1. $\{2, 4\}$
 $\{0, 1, 2, 3, 4, 6\}$

2. $-6, 0$

3. $13, 21$

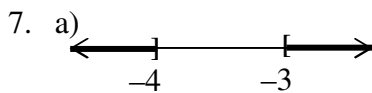
4. $2, 3$

5. No solution



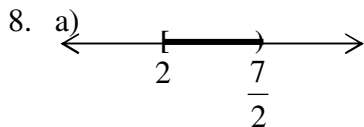
b) $\left\{x \mid \frac{4}{3} < x \leq 4\right\}$

c) $\left[\frac{4}{3}, 4\right]$



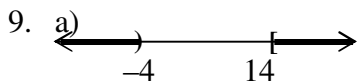
b) $\{x \mid -4 \leq x \leq -3\}$

c) $[-4, 3]$



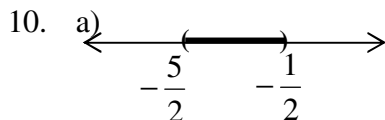
b) $\left\{x \mid 2 \leq x < \frac{7}{2}\right\}$

c) $\left[2, \frac{7}{2}\right)$



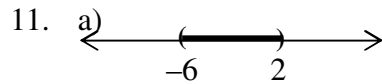
b) $\{x \mid x < -4 \text{ or } x \geq 14\}$

c) $(-\infty, -4) \cup [14, \infty)$



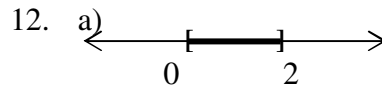
b) $\left\{x \mid -\frac{5}{2} \leq x \leq -\frac{1}{2}\right\}$

c) $\left[-\frac{5}{2}, -\frac{1}{2}\right]$



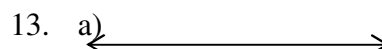
b) $\{x \mid -6 < x < 2\}$

c) $(-6, -2)$



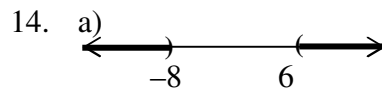
b) $\{x \mid 0 \leq x \leq 2\}$

c) $[0, 2]$



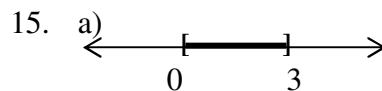
b) No Solution

c) \emptyset



b) $\{x \mid x < -8 \text{ or } x > 6\}$

c) $(-\infty, 8) \cup (6, \infty)$



b) $\{x \mid 0 \leq x \leq 3\}$

c) $[0, 3]$

16. $150 \leq x \leq 200$

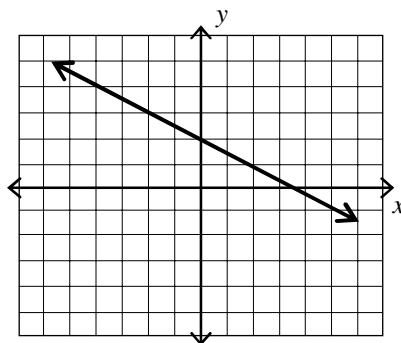
17. Domain: All real number solutions

Range: $(-\infty, 2]$

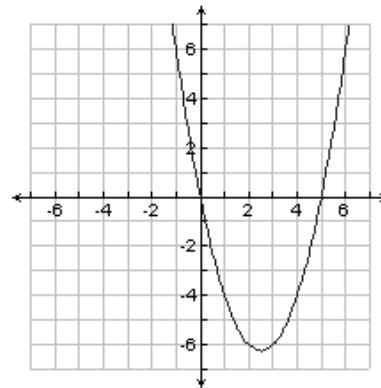
It is a function.

18. 17

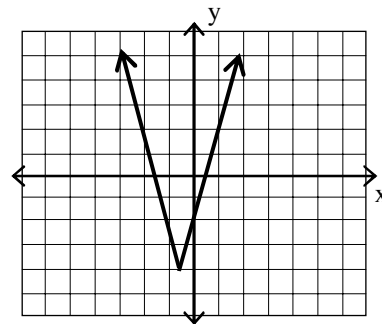
19. $f(x) = -\frac{1}{2}x + 2$



20. $f(x) = x^2 - 5x$



21. $f(x) = 2|2x + 1| - 4$



22. a) $4x^2 + 3x + 7$

b) $4x^2 - 9x - 3$

c) $24x^3 + 2x^2 - 3x + 10$

23. a) $-x^2 - x + 9$

b) $5x^2 - x - 3$

c) $-6x^4 + 3x^3 + 3x^2 - 12x + 18$

24. $3x - 1 + \frac{3}{2x - 1}, x \neq \frac{1}{2}$

25. a) $x + 5$

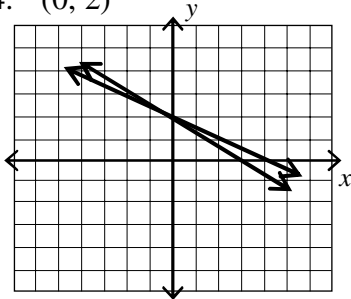
b) 10 cm

CHAPTER 8, FORM E

- | | | |
|------|-------|-------|
| 1. d | 10. a | 18. a |
| 2. b | 11. d | 19. b |
| 3. d | 12. b | 20. a |
| 4. d | 13. c | 21. c |
| 5. d | 14. a | 22. d |
| 6. b | 15. a | 23. b |
| 7. c | 16. d | 24. c |
| 8. a | 17. c | 25. d |
| 9. c | | |
-

CHAPTER 9, FORM A

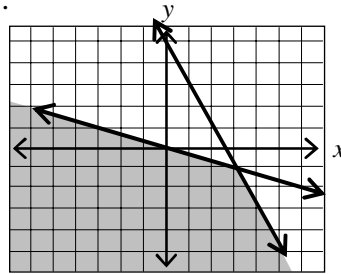
1. No
2. Yes
3. No
4. (0, 2)



5. (1, -1)
6. (-1, -3)
7. (-1, 0)
8. No solution
9. (1, 1, 1)
10. (6, 0, 5)
11. (2, -1, 3)
12. $\left(\frac{3}{2}, -\frac{1}{2}\right)$
13. (5, -3)
14. (3, 1, -2)
15. (5, 4)
16. (6, -2)

17. (1, -2, 3)

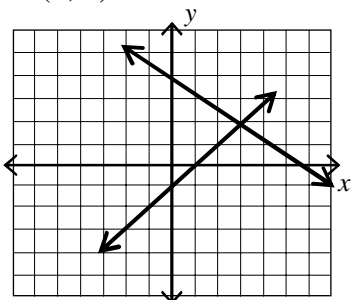
18.



19. \$0.55
 20. $\ell = 22$ ft, $w = 14$ feet
 21. 14 nickels
16 dimes
 22. \$6000 @ 8%
\$4000 @ 10%
 23. 10 ounces @ 30%
30 ounces @ 50%
 24. 600 tickets @ \$4
300 tickets @ \$5
100 tickets @ \$10
 25. a) $x + y \geq 30$
 $40x + 60y \leq 1600$
b) 10 small prints, 20 large prints
Answers may vary.
-

CHAPTER 9, FORM B

1. Yes
2. No
3. Yes
4. (3, 2)

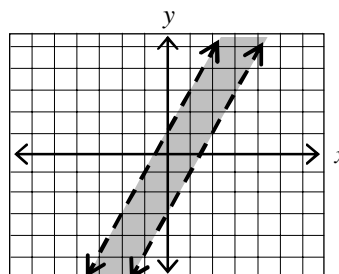


5. (1, 3)
6. (-1, 2)
7. (-2, 2)
8. No solution (inconsistent system)
9. (0, -2, 4)
10. $\left(4, \frac{1}{2}, -3\right)$
11. (1, 2, -2)
12. (3, -1)
13. (1, -1)
14. (0, 1, -1)
15. (7, -1)

16. $\left(\frac{1}{2}, -3\right)$

17. (-2, 3, 1)

18.



19. 12 and 25

20. $\ell = 30$ feet, $w = 18$ feet

21. 515 mph

22. 25 @ \$3

5 @ \$5

23. $16\frac{2}{3}$ @ 50%

$83\frac{1}{3}$ @ 80%

24. 435

25. a) $x + y \leq 530$

$9x + 14y \geq 5870$

$x \geq 0, y \geq 0$

b) 310 student tickets, 220 adult tickets

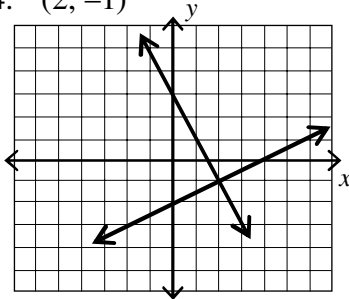
Answers may vary.

CHAPTER 9, FORM C

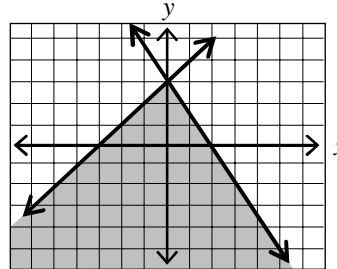
1. No

2. Yes

3. Yes

4. $(2, -1)$ 5. $\left(-5, -\frac{10}{3}\right)$ 6. $(2, 3)$ 7. $(5, 0)$ 8. Infinite solutions along $7x + 2y = 3$ 9. $(2, -1, 3)$ 10. $(-3, -4, 2)$ 11. $(1, 3, 5)$ 12. $(-1, 4)$ 13. $(3, -4)$ 14. $(2, 0, 4)$ 15. $(3, -1)$ 16. $(-3, -4)$ 17. $(2, -1, 4)$

18.

19. $\ell = 18$ feet, $w = 7$ feet

20. 17 in, 24 in, 28 in

21. 8 liters of 35%

2 liters of 60%

22. 17 dimes, 9 nickels

23. \$2200 @ 6%

\$3900 @ 7%

24. 39 \$1

13 \$5

8 \$10

25. a) $x + y \geq 25$

$$10x + 30y \leq 1500$$

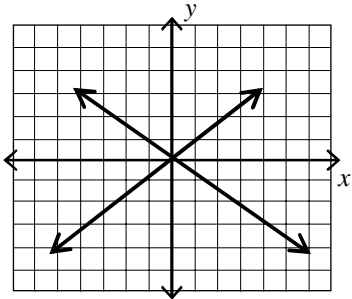
$$x \geq 0, y \geq 0$$

b) 10 small prints, 16 large prints

Answers may vary.

CHAPTER 9, FORM D

1. No
2. No
3. Yes
4. (0, 0)

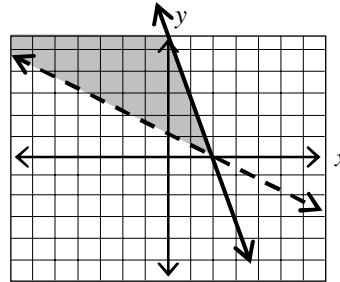


5. (22, -5)
6. (4, 3)
7. No solution (inconsistent solution)
8. (2, -4)
9. (1, 2, -3)
10. No solution (inconsistent solution)
11. $\left(\frac{1}{2}, \frac{1}{3}, -1\right)$
12. (-2, 3)
13. (5, -1)
14. (1, 2, -3)
15. $\left(-\frac{10}{9}, -\frac{7}{9}\right)$

16. Infinite solutions along $5x + y = 3$

17. $\left(\frac{3}{2}, \frac{1}{2}, 2\right)$

- 18.



19. 60 dimes, 25 quarters
20. 62 ft by 155 ft
21. 12 pounds
22. 110 mph
23. \$2500 @ 8%
\$5500 @ 10%
24. 113,000 units @ \$5
15,800 units @ \$10
7900 units @ \$20
25. a) $x + y \leq 1200$
 $y \leq \frac{1}{2}x$
 $x \leq 3y + 600$
 $x \geq 0, y \geq 0$
b) Maximum profit \$200,
800 units of A and 400 units of B
Answers may vary.

CHAPTER 9, FORM E

- | | | |
|------|-------|-------|
| 1. c | 10. d | 18. a |
| 2. c | 11. c | 19. b |
| 3. b | 12. b | 20. b |
| 4. c | 13. d | 21. a |
| 5. b | 14. a | 22. a |
| 6. d | 15. d | 23. c |
| 7. c | 16. c | 24. b |
| 8. d | 17. c | 25. d |
| 9. b | | |
-

CHAPTER TEST 10, FORM A

- | | | |
|----------------------|--|-----------------------------------|
| 1. 5 | 10. $9 - 4\sqrt{5}$ | 18. 13 |
| 2. $13i$ | 11. $y^{\frac{1}{5}}$ | 19. $1 - 13i$ |
| 3. $3x^2y\sqrt{5y}$ | 12. $-5 + 4\sqrt[3]{3} - 2\sqrt[3]{9}$ | 20. 24 |
| 4. $2\sqrt[3]{3}$ | 13. $64^{\frac{1}{5}}y^{\frac{4}{5}}$ | 21. 10 |
| 5. $2x^4\sqrt{3x^3}$ | 14. $(4xy)^{\frac{2}{3}}$ | 22. $\frac{3}{5} + \frac{3}{10}i$ |
| 6. $2x^3\sqrt[3]{9}$ | 15. $\frac{\sqrt[3]{3}}{3}$ | 23. 150 |
| 7. $\frac{1}{2}$ | 16. $\frac{\sqrt{10} - 2}{3}$ | 24. a) 2 seconds
b) 1296 feet |
| 8. $\frac{2}{3}$ | 17. 6 | 25. a) 17.9 mph
b) 450 feet |

CHAPTER TEST 10, FORM B

- | | | |
|-----------------------|---|--------------------------------------|
| 1. $11i$ | 10. $15 - 6\sqrt{6}$ | 18. -12 |
| 2. 8 | 11. y^2 | 19. $3 - 8i$ |
| 3. $5x^2y^3\sqrt{3x}$ | 12. $-7 + 2\sqrt[4]{3} - 5\sqrt[4]{27}$ | 20. 36 |
| 4. $2\sqrt[3]{12}$ | 13. $5^{\frac{1}{3}}y^{\frac{2}{3}}$ | 21. $23 - 14i$ |
| 5. $3y^4\sqrt{y^3}$ | 14. $(4x^2y)^{\frac{2}{5}}$ | 22. $\frac{15}{13} + \frac{10}{13}i$ |
| 6. $5r^3$ | 15. $\frac{3\sqrt[3]{2}}{2}$ | 23. 60 |
| 7. $\frac{1}{3}$ | 16. $\frac{5 + \sqrt{15}}{2}$ | 24. 71.6 feet per second |
| 8. $\frac{1}{2}$ | 17. 15 | 25. 256 ft |
-

CHAPTER TEST 10, FORM C

- | | | |
|-----------------------------|---|--------------------------------------|
| 1. $10i$ | 10. $16 - 2\sqrt{15}$ | 17. 77 |
| 2. 11 | 11. $x^{\frac{19}{12}}$ | 18. 18 |
| 3. $12a^2b^2\sqrt{b}$ | 12. $-6 + 2\sqrt[3]{4} - 5\sqrt[3]{16}$ | 19. $2 + 7i$ |
| 4. $2\sqrt[4]{6}$ | 13. $7^{\frac{1}{3}}x^{\frac{2}{3}}y^{\frac{1}{3}}$ | 20. 42 |
| 5. $3a^2b$ | 14. $(3x^4y^2)^{\frac{3}{5}}$ | 21. $14 + 3i$ |
| 6. $5x^4y^2$ | 15. $\frac{3\sqrt[3]{4}}{2}$ | 22. $\frac{10}{29} + \frac{25}{29}i$ |
| 7. $\frac{4}{9}$ | 16. $2\sqrt{3} - 3$ | 23. 72 |
| 8. $\frac{3\sqrt[3]{3}}{4}$ | | 24. 256 feet |
| 9. $11\sqrt{5}$ | | 25. 160 feet per sec |

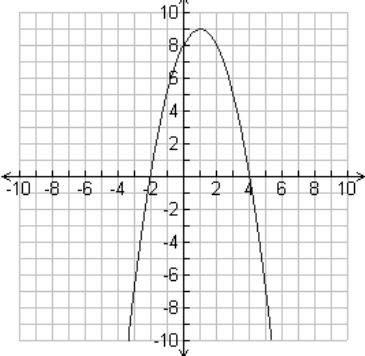
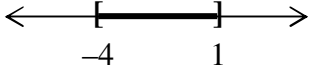
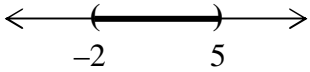
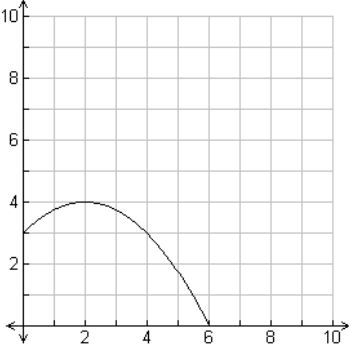
CHAPTER TEST 10, FORM D

- | | | |
|--------------------------|---|----------------------------------|
| 1. 0.6 | 9. $-2\sqrt{6}$ | 17. 2 |
| 2. $-\frac{13}{12}$ | 10. $56 - 16\sqrt{6}$ | 18. No solution |
| 3. $5a^2b^2c\sqrt{3abc}$ | 11. $4x^{\frac{4}{3}}y^2$ | 19. $3 - 12i$ |
| 4. $\frac{5}{4}$ | 12. $\sqrt{10} + \sqrt{15} - \sqrt{6} - 3$ | 20. $147i$ |
| 5. $3xy^2$ | 13. $9^{\frac{3}{4}}x^{\frac{9}{4}}y^{\frac{3}{4}}$ | 21. $-3 - 36i$ |
| 6. $12x^3y\sqrt{2y}$ | 14. $(2a + 3b)^{\frac{3}{5}}$ | 22. $\frac{1}{2} + \frac{1}{2}i$ |
| 7. $2\sqrt{2}$ | 15. $\sqrt{2}$ | 23. $4 + \sqrt{3}$ |
| 8. $\frac{4}{3}$ | 16. $-2\sqrt{2} - 4$ | 24. 576 feet |
| | | 25. 80 feet per sec |

CHAPTER TEST 10, FORM E

- | | | |
|------|-------|-------|
| 1. d | 10. c | 19. b |
| 2. a | 11. d | 20. c |
| 3. b | 12. a | 21. b |
| 4. b | 13. a | 22. b |
| 5. c | 14. c | 23. c |
| 6. c | 15. c | 24. d |
| 7. a | 16. c | 25. c |
| 8. c | 17. b | |
| 9. a | 18. c | |
-

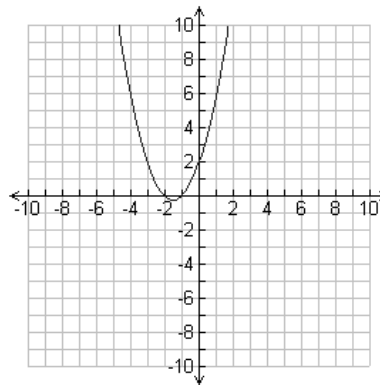
CHAPTER 11, FORM A

1. ± 6
 2. $-4, 1$
 3. $-4 \pm \sqrt{19}$
 4. $\frac{1 \pm \sqrt{26}}{5}$
 5. $3 \pm \sqrt{5}$
 6. $\frac{-1 \pm \sqrt{97}}{8}$
 7. $-10, 7$
 8. $\pm 9i$
 9. $\frac{-3 \pm \sqrt{3}}{6}$
 10. $0, 5$
 11. $\frac{5}{4}$
 12. $\frac{2}{3} \pm i$
 13. $\frac{3 \pm \sqrt{17}}{2}$
 14. $1, \frac{1}{7}$
 15. No solution
 16. 8
 17. $\pm i, \pm 3i$
 18. $\frac{5}{8}, 2$
 19. a) Downwards
b) $(-2, 0), (4, 0)$
c) $(0, 8)$
d) $(1, 9)$
e) $f(x) = -x^2 + 2x + 8$
- 
20. a) $[-4, 1]$
b) 
 21. a) $(-2, 5)$
b) 
 22. 0.87 seconds
 23. 18 feet, 10 feet
 24. a) 4 meters
b) 6 meters
c) $y = -0.25x^2 + x + 3$
- 
25. $10 \text{ yd} \leq \text{width} \leq 35 \text{ yd}$

CHAPTER 11, FORM B

1. ± 8
2. $\frac{2 \pm 2\sqrt{2}}{11}$
3. $-2 \pm \sqrt{11}$
4. $-\frac{3}{5}, -\frac{7}{5}$
5. $-6, -2$
6. $\frac{5 \pm \sqrt{39}}{7}$
7. $-1, \frac{1}{3}$
8. $3 \pm \sqrt{11}$
9. $2 \pm 6i$
10. $0, 2$
11. -5
12. $\frac{-6 \pm \sqrt{6}}{6}$

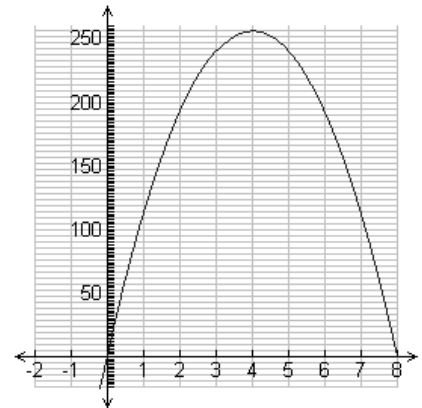
13. $-2, \frac{1}{4}$
14. $\pm \frac{1}{3}$
15. No solution
16. 7
17. $\pm 2, \pm 5$
18. $-\frac{3}{2}, -\frac{7}{4}$
19. a) Upwards
b) $(-2, 0), (-1, 0), (0, 2)$
c) $\left(-\frac{3}{2}, -\frac{1}{4}\right)$
d) $x = -\frac{3}{2}$
e) $f(x) = x^2 + 3x + 2$



20. a) $(-\infty, -3) \cup (7, \infty)$
b)

21. a) $(-2, 6)$
b)

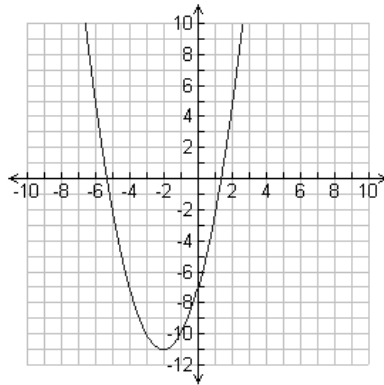
22. ≈ 5.48 feet
23. 4 feet, 14 feet
24. a) 256 feet
b) 8 seconds
c) $h = -16t^2 + 128t$



25. a) 15 yd by 15 yd
b) 225 yd^2

CHAPTER 11, FORM C

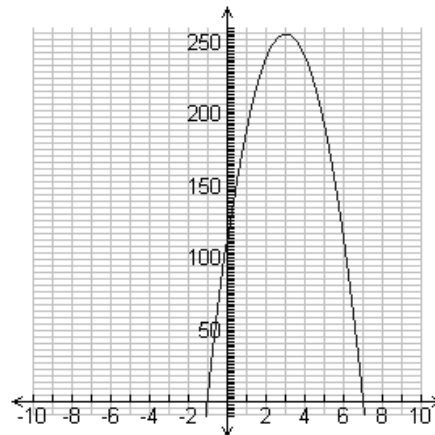
1. ± 5
2. $\frac{-5 \pm \sqrt{7}}{4}$
3. $-1, 13$
4. $-\frac{3}{2}, 2$
5. $\frac{-7 \pm \sqrt{21}}{2}$
6. $\frac{2 \pm \sqrt{2}}{2}$
7. $-9, -7$
8. $\frac{4}{3}, 2$
9. $-\frac{9}{2}, 0$
10. $7 \pm \sqrt{107}$
11. $\pm 2i$
12. $-1, 5$
13. $-\frac{9}{7}, 7$
14. $\frac{1 \pm i\sqrt{23}}{2}$
15. 1
16. 6
17. $-3, -2, 2, 3$
18. $-12, -1$
19.
 - a) Upwards
 - b) $(-2 \pm \sqrt{11}, 0)$ $(0, -7)$
 - c) $(-2, -11)$
 - d) $x = -2$
 - e) $f(x) = x^2 + 4x - 7$



20. a) $\left[-3, \frac{5}{2}\right]$
- b)

21. a) $(-\infty, -5) \cup (2, \infty)$
- b)

22. 4.68 seconds
23. 6 inches, 8 inches
24. a) 256 feet
- b) 3 seconds
- c) $s = 112 + 96t - 16t^2$



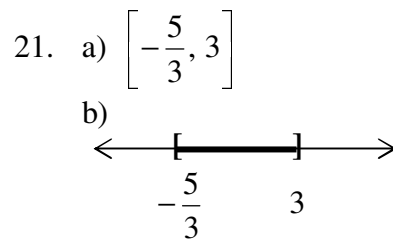
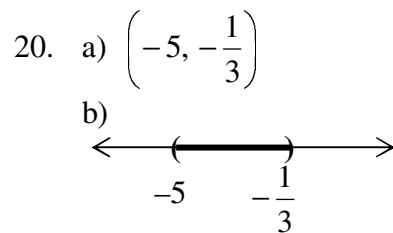
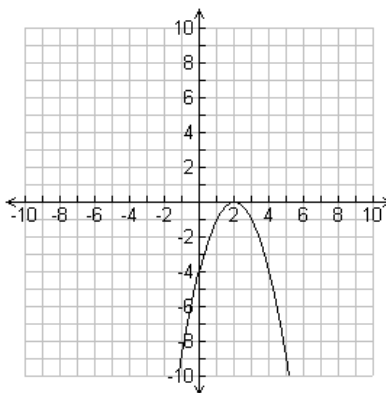
25. a) $0 \text{ feet} \leq \text{width} \leq 40 \text{ feet}$
- b) $0 \text{ feet} \leq \text{length} \leq 60 \text{ feet}$

CHAPTER 11, FORM D

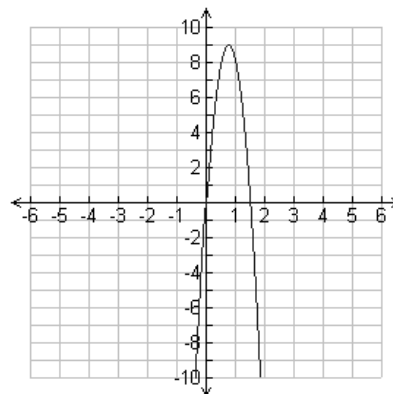
1. ± 6
2. $-2, 5$
3. $-9 \pm \sqrt{23}$
4. $-3, -2$
5. $-2 \pm \sqrt{2}$
6. $\frac{7 \pm \sqrt{37}}{6}$
7. $\frac{-1 \pm \sqrt{35}i}{2}$
8. $-2 \pm \sqrt{2}$
9. $-\frac{1}{6}, 5$
10. $2 \pm 2i$
11. $\frac{1 \pm i\sqrt{35}}{9}$
12. $\frac{-6 \pm \sqrt{78}}{3}$

13. 6, 10
14. $-\frac{1024}{243}, -32$
15. $\pm 2i$
16. $\frac{3}{4}$
17. $\pm 3, \pm \sqrt{5}$
18. $\frac{11}{4}, \frac{7}{4}$
- 19.

- a) Downwards
- b) $(2, 0), (0, -4)$
- c) $(2, 0)$
- d) $x = 2$
- e) $f(x) = -x^2 + 4x - 4$



22. 46.8 seconds
23. 24 miles
24. a) 9 feet
- b) 1.5 seconds
- c) $h = -16t^2 + 24t$



25. a) 20 feet
- b) 2.1 seconds

CHAPTER 11, FORM E

- | | | |
|------|-------|-------|
| 1. c | 10. d | 19. c |
| 2. b | 11. b | 20. b |
| 3. d | 12. d | 21. b |
| 4. d | 13. c | 22. a |
| 5. a | 14. b | 23. b |
| 6. b | 15. c | 24. b |
| 7. a | 16. d | 25. d |
| 8. d | 17. d | |
| 9. a | 18. c | |
-

CHAPTER 12, FORM A

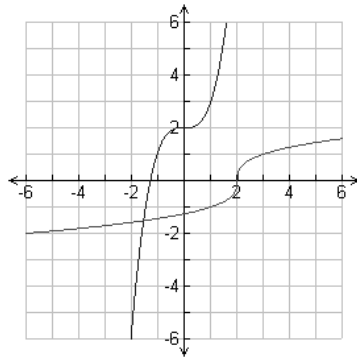
1. $18x^2 - 24x + 9$

2. a) $f^{-1}(x) = \frac{x+3}{4}$

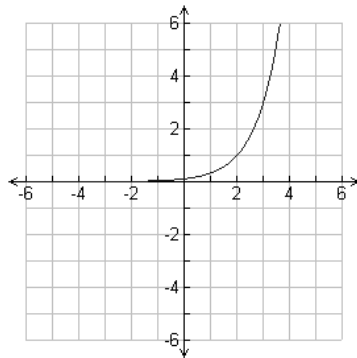
b) The graphs are symmetric about the line $y = x$ or

$$f[f^{-1}(x)] = f^{-1}[f(x)] = x$$

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



4. $y = 3^{x-2}$



5. 3

6. 2

7. a) \$3431.96

b) ≈ 16.9 years

8. ≈ 9.9 grams

9. $\approx 2,593,243$

10. $5^4 = 625$

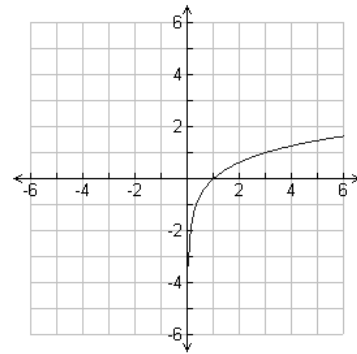
11. $8^{-2} = \frac{1}{64}$

12. -5

13. 2

14. 10

15. $y = \log_3 x$



16. $\log_5 8 + 3\log_5 x - \log_5 y - 2\log_5 z$

17. $3\log_4 x + \frac{2}{5}\log_4 y$

18. $\log_3 \frac{\sqrt[5]{x}}{y^2}$

19. $\log_5 \frac{x^3}{yz^4}$

20. ≈ 1.0397

21. ≈ 0.9522

22. ≈ 1.4373

23. ≈ 8.4721

24. 1

25. 492 cases

CHAPTER 12, FORM B

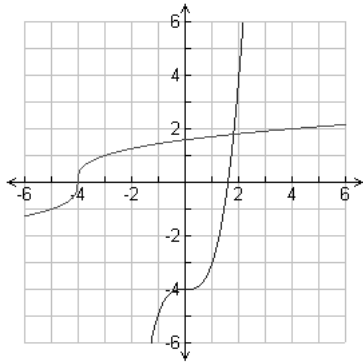
1. $25x^2 - 30x + 7$

2. a) $f^{-1}(x) = \frac{x+7}{4}$

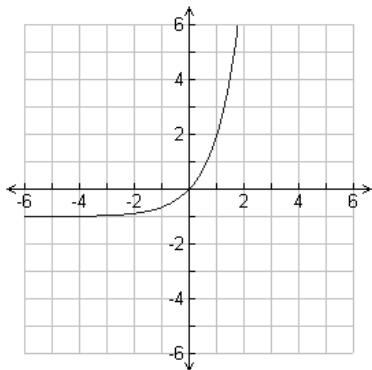
b) The graphs are symmetric about the line $y = x$ or

$$f[f^{-1}(x)] = f^{-1}[f(x)] = x$$

3. $y = x^3 - 4$ and $y = \sqrt[3]{x+4}$



4. $y = 3^x - 1$



5. 2

6. 3

7. a) \$8516.06

b) ≈ 8.7 years

8. a) ≈ 111.82 g

b) ≈ 24.8 years

9. ≈ 19.25 years

10. $5^3 = 125$

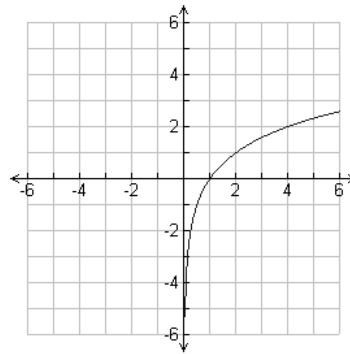
11. $3^{-4} = \frac{1}{81}$

12. -6

13. 4

14. 2

15. $y = \log_2 x$



16. $\log_6 5 + 2\log_6 x - \log_6 4 - 3\log_6 y$

17. $\log_5 6 + 3\log_5 x + 2\log_5 y + \frac{1}{2}\log_5 z$

18. $\log_2 \frac{x^3 y^6}{\sqrt[5]{z}}$

19. $\log_6 \frac{x^5}{y^2(z+3)}$

20. ≈ 0.2682

21. ≈ 3.3219

22. ≈ 2.1484

23. 5

24. 3.4

25. $\approx \$0.37$

CHAPTER 12, FORM C

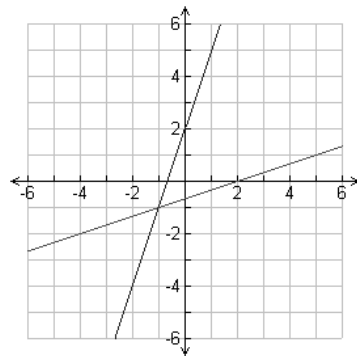
1. $18x^2 - 48x + 31$

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

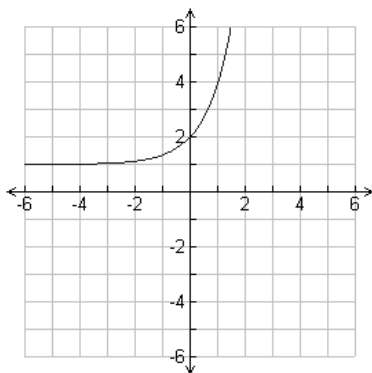
b) The graphs are symmetric about the line $y = x$ or

$$f[f^{-1}(x)] = f^{-1}[f(x)] = x$$

3. $y = 3x + 2$ and $y = \frac{x-2}{3}$



4. $y = 3^x + 1$



5. 4

6. $\frac{5}{3}$

7. a) \$13,292.83

b) ≈ 20.45 years

8. \$1297.27

9. 5935

10. $8^3 = 512$

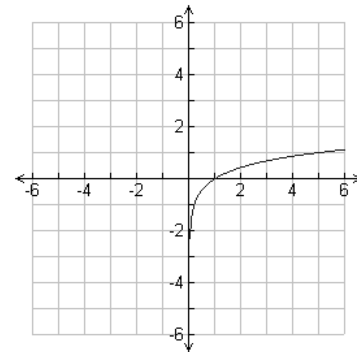
11. $6^{-3} = \frac{1}{216}$

12. -2

13. $\frac{1}{5}$

14. 12

15. $y = \log_5 x$



16. $\log_4 2 + 3\log_4 x - \log_4 5 - 2\log_4 y$

17. $4\log_3 x + 2\log_3 y + \frac{1}{2}\log_3 z$

18. $\log_5 \frac{\sqrt[4]{xz^4}}{y^2}$

19. $\log_3 \frac{x^4}{\sqrt[3]{y^2}}$

20. ≈ 35.3377

21. ≈ 1.2770

22. ≈ 2.3687

23. 10

24. 9

25. 33.24 years

CHAPTER 12, FORM D

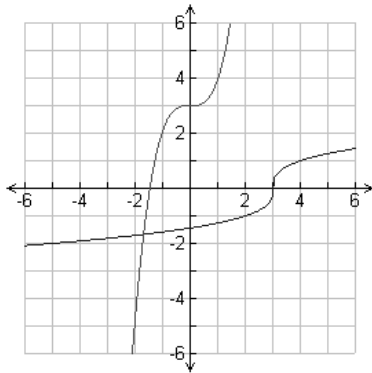
1. $\frac{15x}{7-24x}$

2. a) $f^{-1}(x) = \frac{x^3 + 2}{4}$

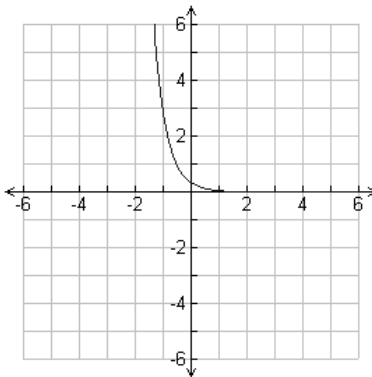
b) The graphs are symmetric about the line $y = x$ or

$$f[f^{-1}(x)] = f^{-1}[f(x)] = x$$

3. $y = (x-3)^{\frac{1}{3}}$ and $y = x^3 + 3$



4. $y = 3^{-2x-1}$



5. 1

6. $-\frac{1}{3}$

7. a) \$6571.66

b) ≈ 100.81 years

8. ≈ 7.07 grams

9. 7.37 years

10. $7^4 = 2401$

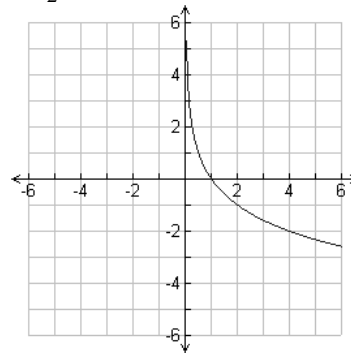
11. $5^{\frac{1}{2}} = \sqrt{5}$

12. $\frac{1}{256}$

13. 10

14. 2

15. $y = \log_{\frac{1}{2}} x$



16. $\log_3 5 + 4 \log_3 x - \log_3 6 - 2 \log_3 y$

17. $\log_2 5 + 3 \log_2 x + 2 \log_2 y + \frac{1}{4} \log_2 z$

18. $\log_6 \frac{\sqrt[3]{z^2}}{y^3 \sqrt[4]{x^3}}$

19. $\log_5 \frac{x^4}{y^8 \sqrt{z}}$

20. 0.4250

21. -0.2553

22. 0.7052

23. $\frac{9}{5}$

24. 2

25. ≈ 206 cases

CHAPTER 12, FORM E

- | | | |
|------|-------|-------|
| 1. d | 10. b | 19. a |
| 2. a | 11. d | 20. c |
| 3. d | 12. a | 21. d |
| 4. b | 13. b | 22. a |
| 5. b | 14. a | 23. b |
| 6. c | 15. c | 24. c |
| 7. d | 16. b | 25. c |
| 8. c | 17. d | |
| 9. b | 18. b | |
-

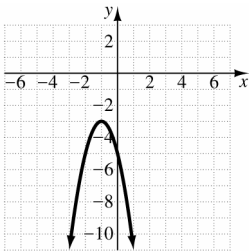
CHAPTER 13, Form A

1. Downwards

b) $(-1, -3)$

c) $x = -1$

$$y = -2(x+1)^2 - 3$$

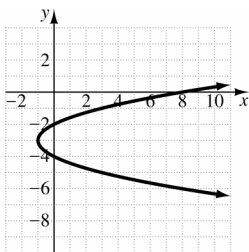


2. a) Right

b) $(-1, -3)$

c) $y = -3$

$$x = (y+3)^2 - 1$$

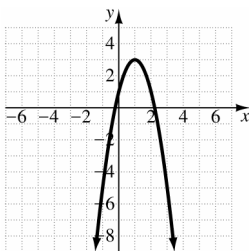


3. a) Downwards

b) $(1, 3)$

c) $x = 1$

$$y = -2x^2 + 4x + 1$$

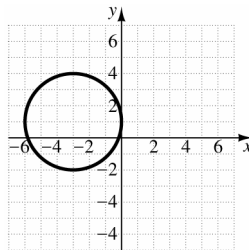


4. 10

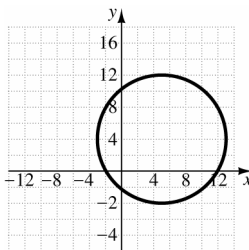
5. $2\sqrt{26}$

6. $(-3, 1); 3$

$$(x+3)^2 + (y-1)^2 = 9$$

7. $(5, 4); 8$

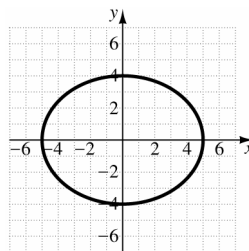
$$x^2 + y^2 - 10x - 8y - 23 = 0$$



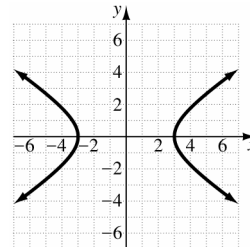
8. $(x-7)^2 + (y-6)^2 = 8$

9. $(x-4)^2 + y^2 = 20$

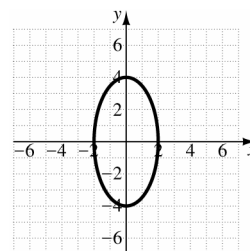
10. $\frac{x^2}{25} + \frac{y^2}{16} = 1$



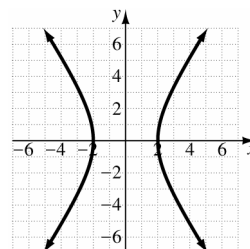
11. $\frac{x^2}{9} - \frac{y^2}{4} = 1$



12. $16x^2 + 4y^2 = 64$



13. $9x^2 - 4y^2 = 36$



14. $(3, 12), (2, 10)$

15. $(7, 6), (-6, -7)$

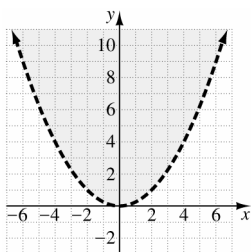
16. No solution

CHAPTER 13, FORM A (Cont)

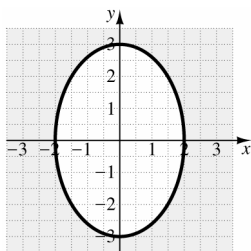
17. (2, 4), (2, -4)
 (-2, 4), (-2, -4)

18. (2, 1), (2, -1)
 (-2, 1), (-2, -1)

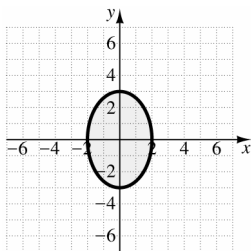
19. $x^2 < 4y$



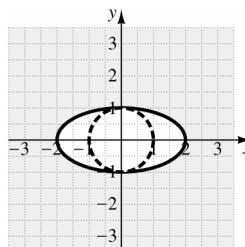
20. $\frac{x^2}{4} + \frac{y^2}{9} \geq 1$



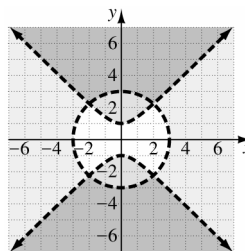
21. $\frac{x^2}{4} + \frac{y^2}{9} \leq 1$



22.
$$\begin{cases} x^2 + y^2 > 1 \\ \frac{x^2}{4} + y^2 \geq 1 \end{cases}$$



23.
$$\begin{cases} y^2 - x^2 > 1 \\ x^2 + y^2 > 9 \end{cases}$$



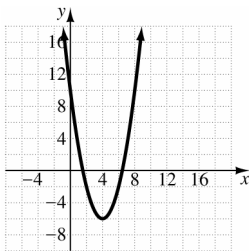
24. $y = -\frac{2}{125}x^2$

25. $\frac{x^2}{225} + \frac{y^2}{100} = 1$

CHAPTER 13, Form B

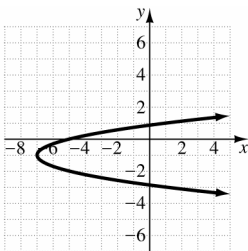
1. a) Upwards
 b) (4, -6)
 c) $x = 4$

$$y = (x - 4)^2 - 6$$



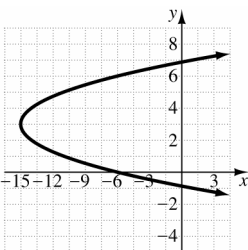
2. a) Right
 b) (-7, -1)
 c) $y = -1$

$$x = 2(y + 1)^2 - 7$$



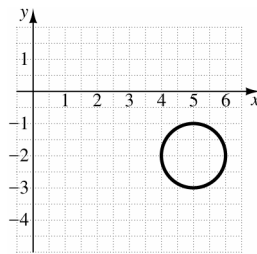
3. a) Right
 b) (-15, 3)
 c) $y = 3$

$$x = y^2 - 6y - 6$$



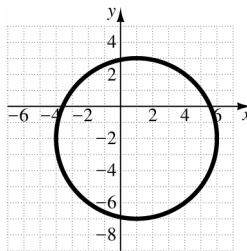
4. 4
 5. $3\sqrt{10}$
 6. (5, -2); 1

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



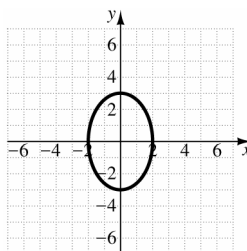
7. (1, -2); 5

$$x^2 + y^2 - 2x + 4y - 20 = 0$$

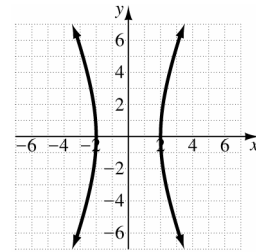


8. $(x - 3)^2 + (y - 2)^2 = 369$
 9. $(x + 3)^2 + (y + 2)^2 = 400$

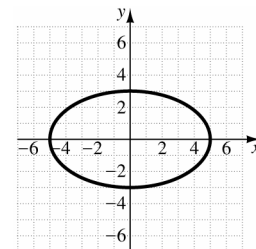
10. $\frac{x^2}{4} + \frac{y^2}{9} = 1$



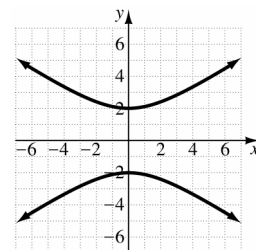
11. $\frac{x^2}{4} - \frac{y^2}{25} = 1$



12. $25y^2 + 9x^2 = 225$



13. $9y^2 - 4x^2 = 36$



14. $(\sqrt{3}, -1), (-\sqrt{3}, -1), (0, 2)$

15. $(-\frac{6}{5}, 4)$

16. (10, 9), (10, -9)

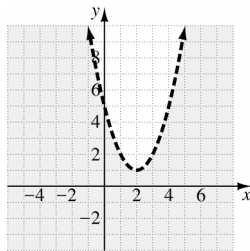
(-10, 9), (-10, -9)

CHAPTER 13, FORM B (Cont)

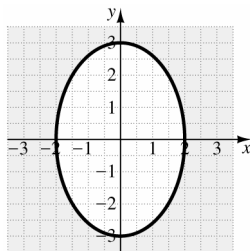
17. (1, 3), (1, -3), (-1, 3), (-1, -3)

18. (2, 1), (2, -1), (-2, 1), (-2, -1)

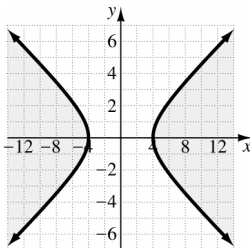
19. $y < (x - 2)^2 + 1$



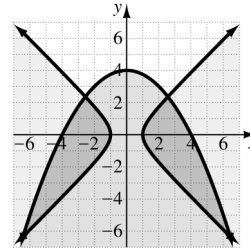
20. $\frac{x^2}{4} + \frac{y^2}{9} \geq 1$



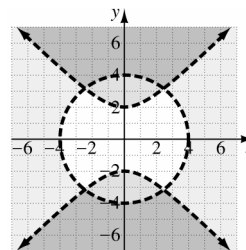
21. $\frac{x^2}{16} - \frac{y^2}{4} \geq 1$



22.
$$\begin{cases} x^2 - y^2 \geq 1 \\ x^2 + 4y \leq 16 \end{cases}$$



23.
$$\begin{cases} x^2 + y^2 > 1 \\ x^2 + y^2 < 16 \end{cases}$$

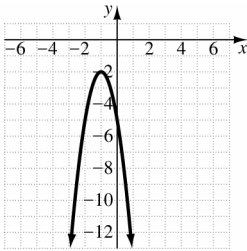


24. $y = -\frac{5}{32}x^2$

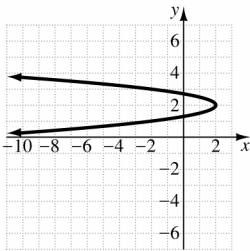
25. $\frac{x^2}{10,000} + \frac{y^2}{6400} = 1$

CHAPTER 13, Form C

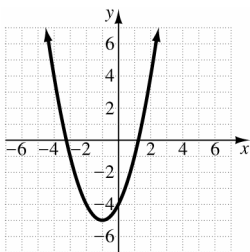
1. a) Downwards
 b) $(-1, -2)$
 c) $x = -1$
 $y = -3(x+1)^2 - 2$



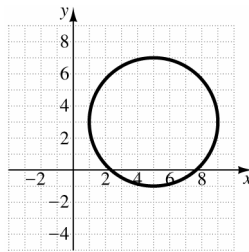
2. a) Left
 b) $(2, 2)$
 c) $y = 2$
 $x = -4(y-2)^2 + 2$



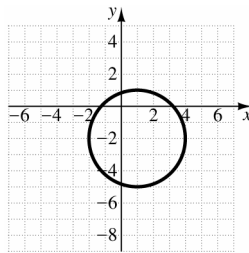
3. a) Upwards
 b) $(-1, -5)$
 c) $x = -1$
 $y = x^2 + 2x - 4$



4. 9
 5. $\sqrt{74}$
 6. $(5, 3); 4$
 $(x-5)^2 + (y-3)^2 = 16$



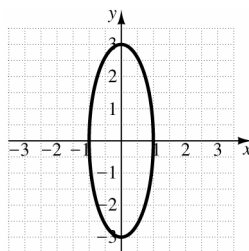
7. $(1, -2); 3$
 $x^2 + y^2 - 2x + 4y - 4 = 0$



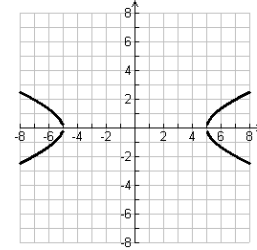
8. $(x+3)^2 + (y-7)^2 = 98$

9. $(x+5)^2 + y^2 = 130$

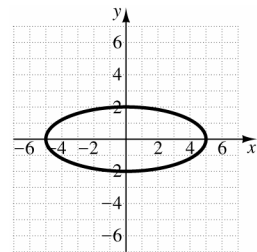
10. $\frac{x^2}{1} + \frac{y^2}{9} = 1$



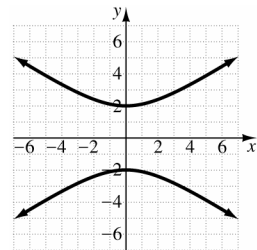
11. $\frac{x^2}{25} - \frac{y^2}{4} = 1$



12. $25y^2 + 4x^2 = 100$



13. $9y^2 - 4x^2 = 36$



14. $(-4, 11), \left(\frac{5}{2}, \frac{5}{4}\right)$

15. $(0, -2), \left(\frac{8}{5}, -\frac{6}{5}\right)$

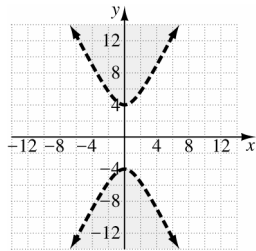
16. $(3, 0), \left(-\frac{9}{5}, \frac{12}{5}\right)$

CHAPTER 13, FORM C (Cont)

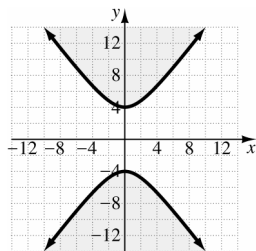
17. $(3, 0), (-3, 0)$

18. No solution

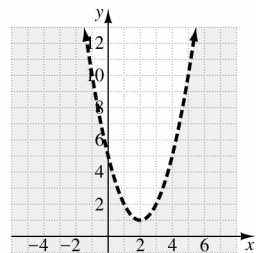
19. $4x^2 < y^2 - 16$



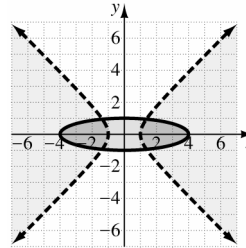
20. $\frac{y^2}{16} - \frac{x^2}{9} \geq 1$



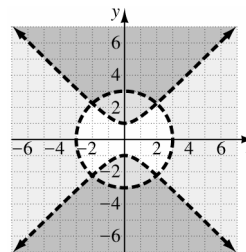
21. $y < (x - 2)^2 + 1$



22.
$$\begin{cases} x^2 - y^2 < 1 \\ x^2 + 16y^2 \leq 16 \end{cases}$$



23.
$$\begin{cases} y^2 - x^2 > 1 \\ x^2 + y^2 > 9 \end{cases}$$



24. $y = -\frac{1}{9}(x - 30)^2 + 100$

25. $\frac{x^2}{3600} + \frac{y^2}{1600} = 1$

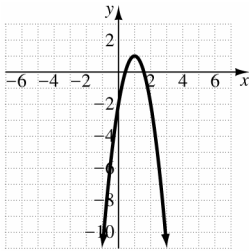
CHAPTER 13, Form D

1. a) Downwards

b) (1, 1)

c) $x = 1$

$$y = -3(x-1)^2 + 1$$

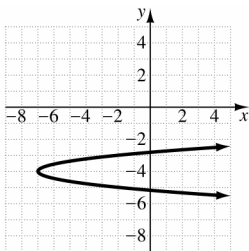


2. a) Right

b) (-7, -4)

c) $y = -4$

$$x = 5(y+4)^2 - 7$$

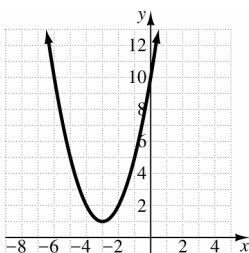


3. a) Upwards

b) (-3, 1)

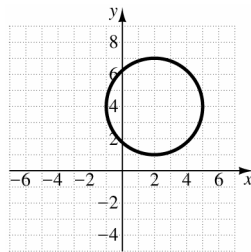
c) $x = -3$

$$y = x^2 + 6x + 10$$

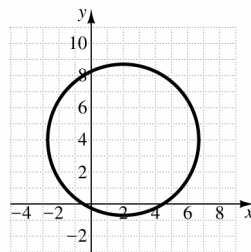
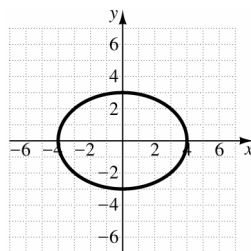
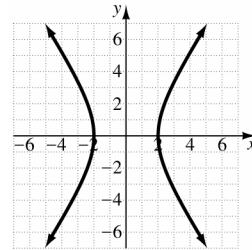
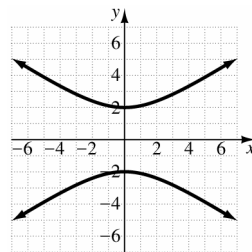
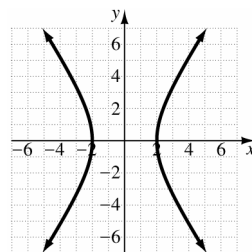
4. $\sqrt{17}$ 5. $2\sqrt{26}$

6. (2, 4); 3

$$(x-2)^2 + (y-4)^2 = 9$$

7. (2, 4); $\sqrt{22}$

$$x^2 + y^2 - 4x - 8y - 2 = 0$$

8. $(x-1)^2 + y^2 = 5$ 9. $(x+3)^2 + (y+4)^2 = 16$ 10. $\frac{x^2}{16} + \frac{y^2}{9} = 1$ 11. $\frac{x^2}{4} - \frac{y^2}{9} = 1$ 12. $9y^2 - 4x^2 = 36$ 13. $9x^2 - 4y^2 = 36$ 14. $(-3, 0), \left(-\frac{12}{5}, \frac{9}{5}\right)$

15. $(\sqrt{3}, \sqrt{5})$
 $(\sqrt{3}, -\sqrt{5})$
 $(-\sqrt{3}, \sqrt{5})$
 $(-\sqrt{3}, -\sqrt{5})$

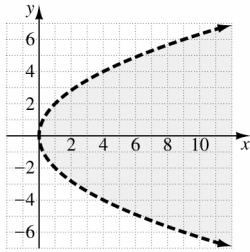
16. No solution

CHAPTER 13, FORM D (Cont)

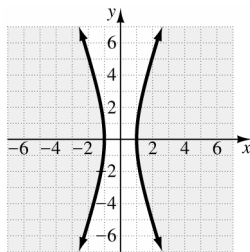
17. $(4, 3), (4, -3), (-4, 3), (-4, -3)$

18. $(\sqrt{3}, 0)$
 $(-\sqrt{3}, 0)$

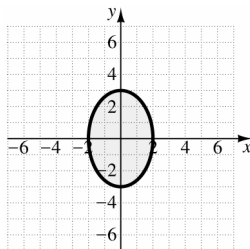
19. $y^2 < 4x$



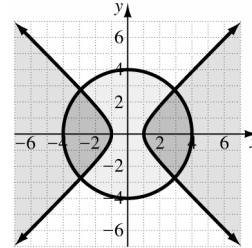
20. $x^2 - \frac{y^2}{9} \geq 1$



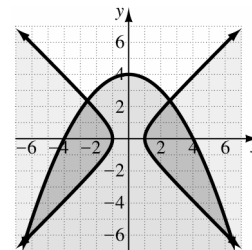
21. $\frac{x^2}{4} + \frac{y^2}{9} \leq 1$



22. $\begin{cases} x^2 - y^2 \geq 1 \\ x^2 + y^2 \leq 16 \end{cases}$



23. $\begin{cases} x^2 - y^2 \geq 1 \\ x^2 + 4y \leq 16 \end{cases}$



24. $y = -\frac{2}{405}(x - 90)^2 + 40$

25. $\frac{x^2}{10,000} + \frac{y^2}{6400} = 1$

CHAPTER 13, FORM E

1. b

2. c

3. b

4. d

5. a

6. c

7. c

8. c

9. a

10. d

11. a

12. c

13. b

14. c

15. b

16. c

17. c

18. d

19. b

20. b

21. a

22. b

23. c

24. d

25. b
