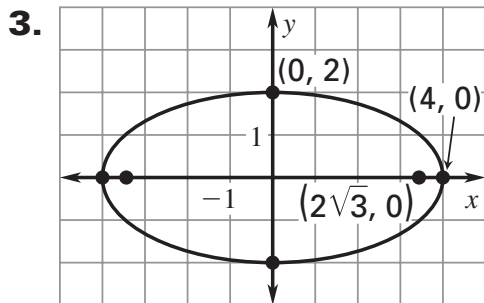


Answers for 9.4

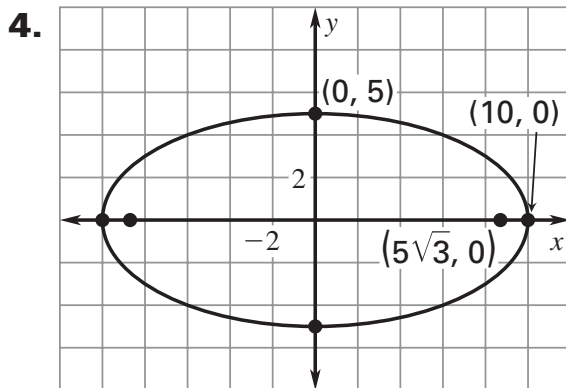
For use with pages 637–641

9.4 Skill Practice

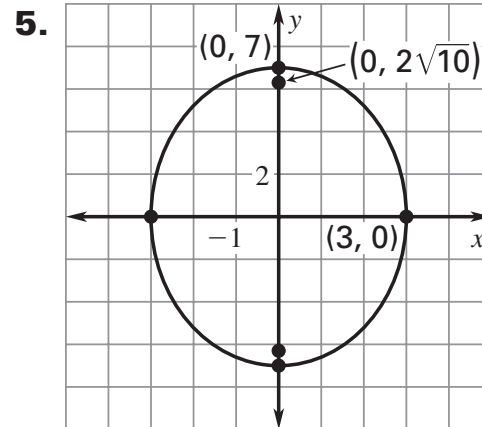
- foci
- Given vertices $(\pm a, 0)$ or $(0, \pm a)$, co-vertices $(0, \pm b)$ or $(\pm b, 0)$, then the foci are located at $(\pm c, 0)$ or $(0, \pm c)$ where $c^2 = a^2 - b^2$.



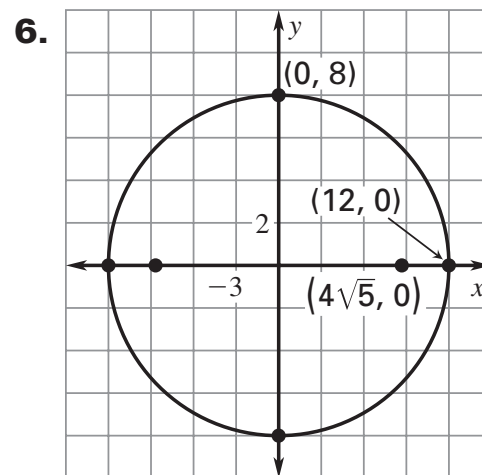
$$(\pm 4, 0), (0, \pm 2), (\pm 2\sqrt{3}, 0)$$



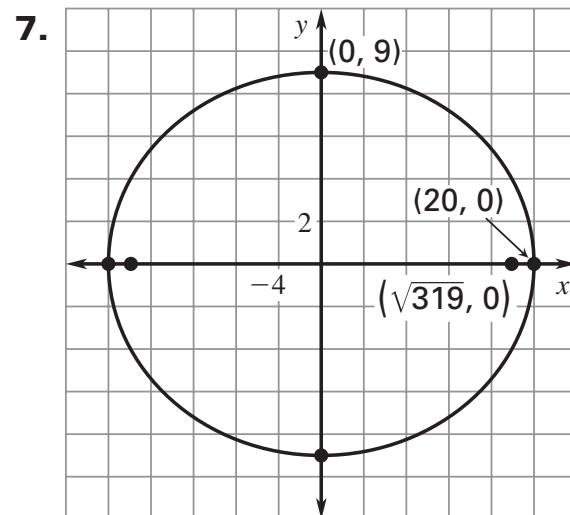
$$(\pm 10, 0), (0, \pm 5), (\pm 5\sqrt{3}, 0)$$



$$(0, \pm 7), (\pm 3, 0), (0, \pm 2\sqrt{10})$$

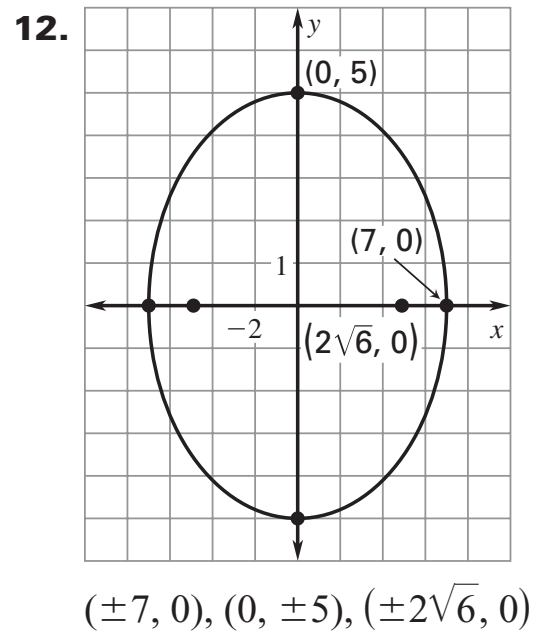
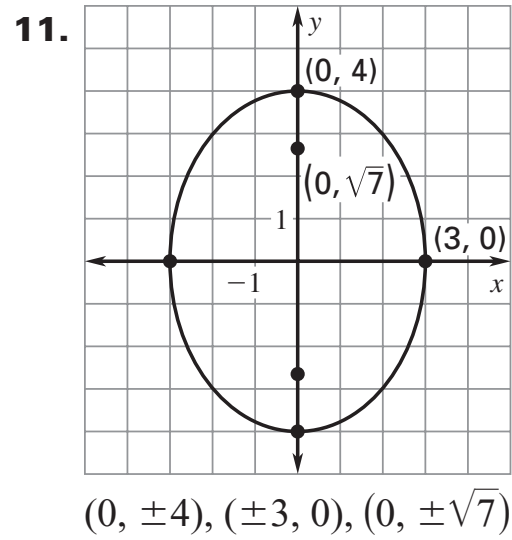
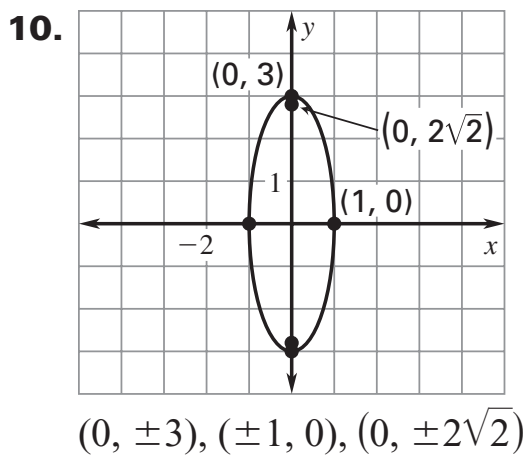
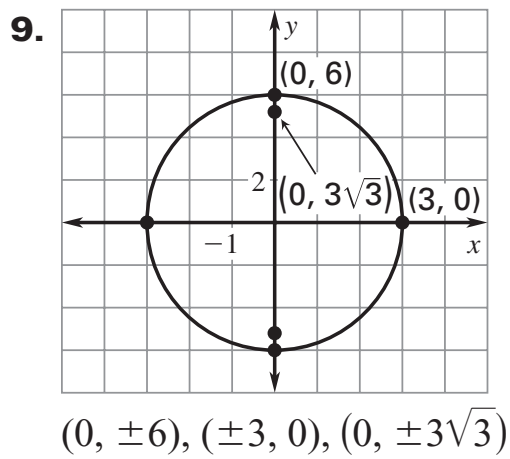
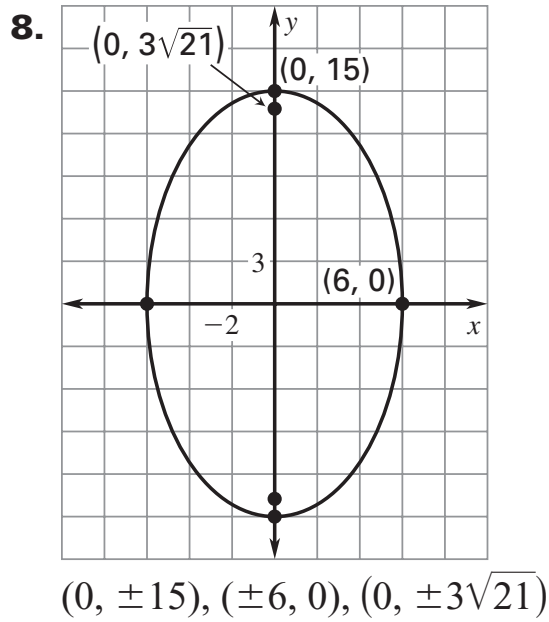


$$(\pm 12, 0), (0, \pm 8), (\pm 4\sqrt{5}, 0)$$

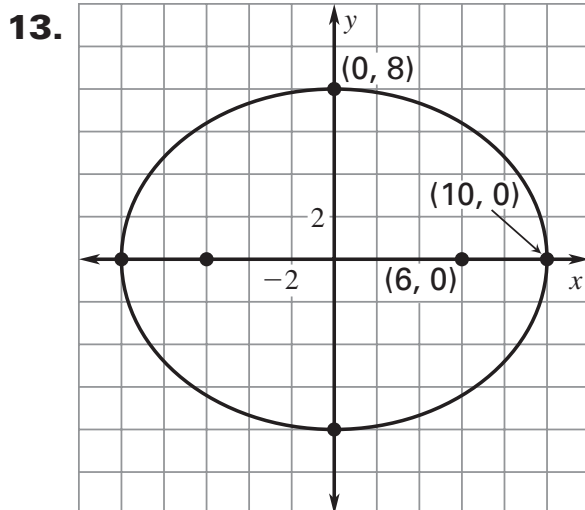


$$(\pm 20, 0), (0, \pm 9), (\pm \sqrt{319}, 0)$$

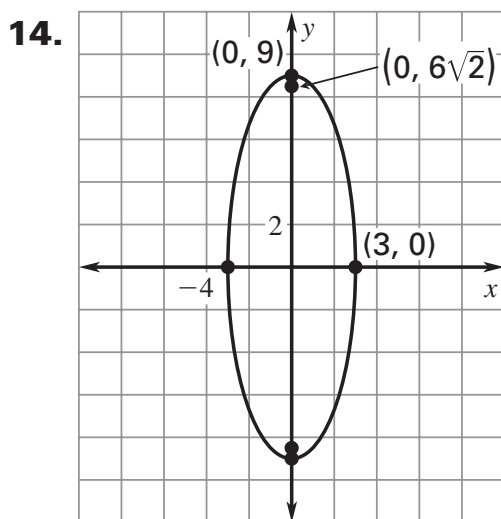
Answers for 9.4 *continued*
For use with pages 637–641



Answers for 9.4 *continued*
For use with pages 637–641

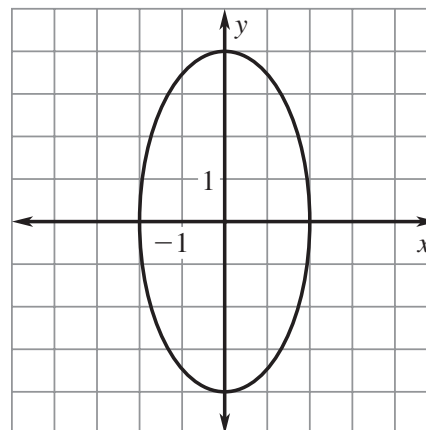


$$(\pm 10, 0), (0, \pm 8), (\pm 6, 0)$$

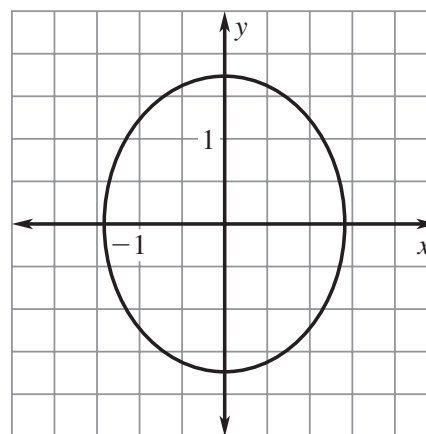


$$(0, \pm 9), (\pm 3, 0), (0, \pm 6\sqrt{2})$$

- 15.** The major axis should be the y -axis, not the x -axis.



- 16.** $a = \sqrt{3}$, not 3, and $b = \sqrt{2}$, not 2.



17. $\frac{x^2}{25} + \frac{y^2}{9} = 1$

18. $\frac{x^2}{36} + \frac{y^2}{100} = 1$

19. $\frac{x^2}{196} + \frac{y^2}{81} = 1$

20. $\frac{x^2}{16} + \frac{y^2}{36} = 1$

21. $\frac{x^2}{121} + \frac{y^2}{144} = 1$

Answers for 9.4 *continued*

For use with pages 637–641

22. $\frac{x^2}{400} + \frac{y^2}{156} = 1$

23. $\frac{x^2}{28} + \frac{y^2}{64} = 1$

24. $\frac{x^2}{16} + \frac{y^2}{9} = 1$

25. $\frac{x^2}{49} + \frac{y^2}{81} = 1$

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

27. $\frac{x^2}{4} + \frac{y^2}{16} = 1$

28. $\frac{x^2}{169} + \frac{y^2}{121} = 1$

29. $\frac{x^2}{16} + \frac{y^2}{7} = 1$

30. $\frac{x^2}{45} + \frac{y^2}{81} = 1$

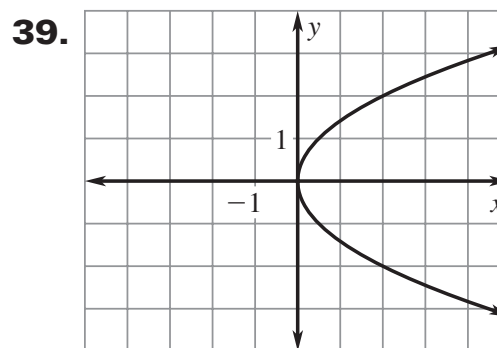
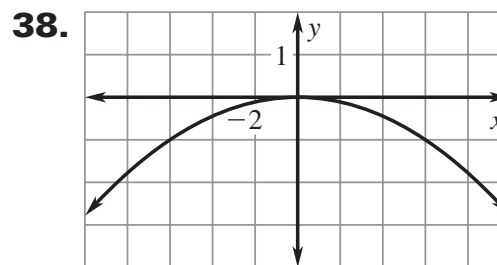
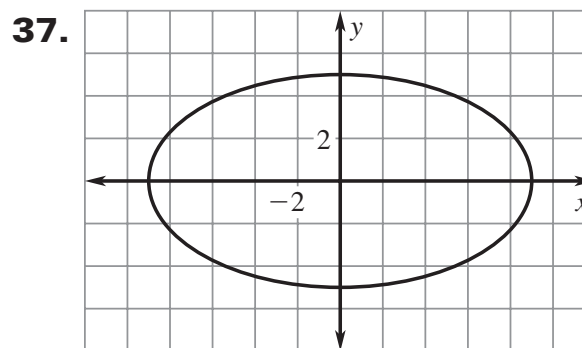
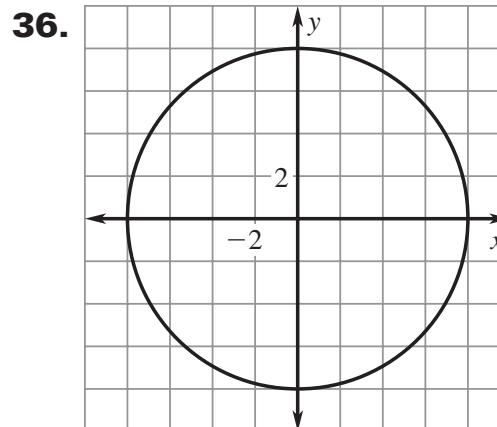
31. $\frac{x^2}{400} + \frac{y^2}{175} = 1$

32. $\frac{x^2}{289} + \frac{y^2}{225} = 1$

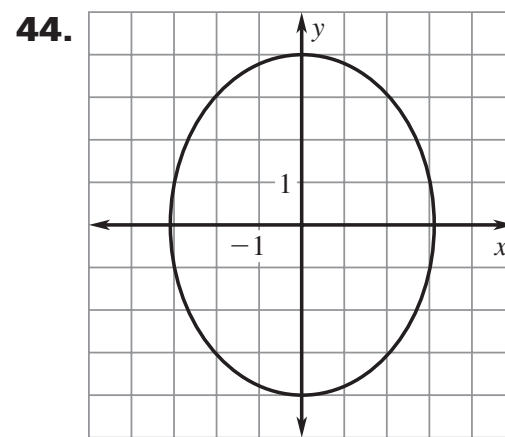
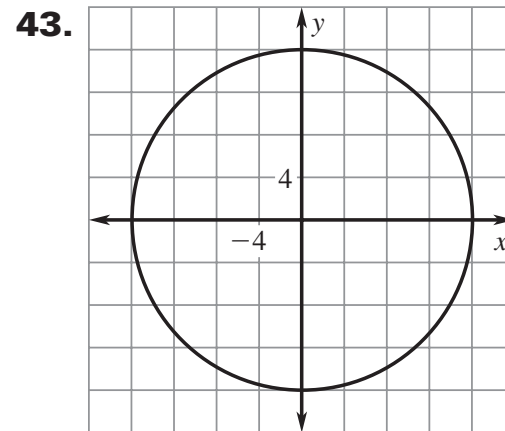
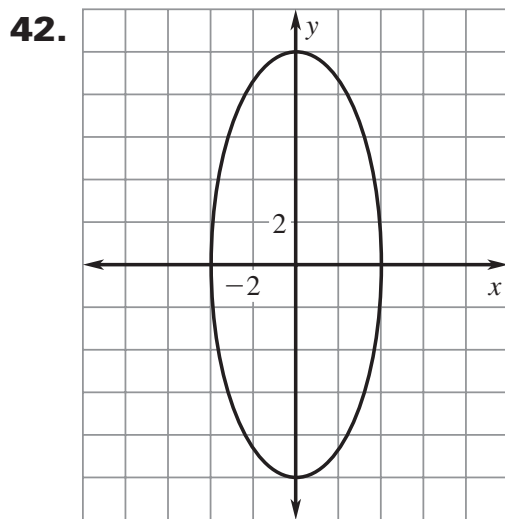
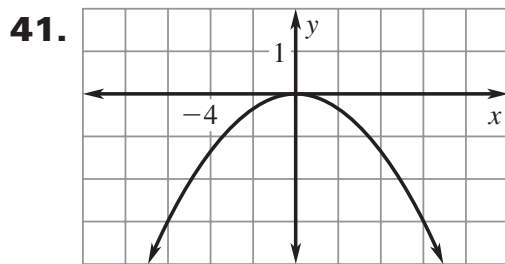
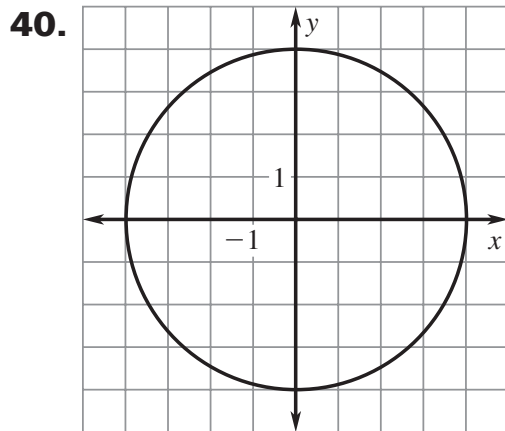
33. $\frac{x^2}{60} + \frac{y^2}{256} = 1$

34. $\frac{x^2}{1024} + \frac{y^2}{1600} = 1$

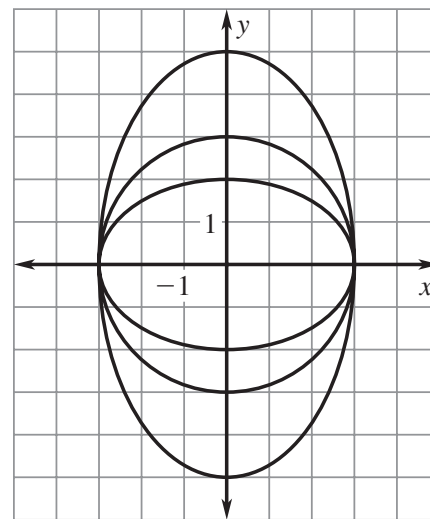
35. B



Answers for 9.4 *continued*
For use with pages 637–641



- 45.** The conic changes from an ellipse elongated along the y -axis, to a circle, to an ellipse elongated along the x -axis.



Answers for 9.4 *continued*

For use with pages 637–641

- 46.** *Sample answer:* $\frac{x^2}{64} + \frac{y^2}{49} = 1$;
 $-10 \leq x \leq 10$, $-10 \leq y \leq 10$, the
 x -intercepts are $(\pm 8, 0)$ and the
 y -intercepts are $(0, \pm 7)$ which can
be found in the window.

- 47.** *Sample answer:* By definition,
the value of $d_1 + d_2$ for the point
 $P(a, 0)$ is the constant

$$\begin{aligned} &\sqrt{(a - (-c))^2 + (0 - 0)^2} + \\ &\sqrt{(a - c)^2 + (0 - 0)^2} = \\ &\sqrt{(a + c)^2} + \sqrt{(a - c)^2} = \end{aligned}$$

$a + c + a - c = 2a$. Similarly,
for the point $(0, b)$, this value is
also $2a$. Since $d_1 = d_2$ for this
point, the distance from $(0, b)$ to
the point $(c, 0)$ is $\frac{1}{2}(2a) = a$.

A right triangle can be formed
with a right angle at the origin and
the two points $(0, b)$ and $(c, 0)$ as
the other two vertices. The legs of
this triangle have lengths b and c ,
and the length of the hypotenuse
is the distance from $(0, b)$ to the
point $(c, 0)$, which was shown to
be a . Therefore, by the
Pythagorean Theorem,
 $c^2 + b^2 = a^2$ or $c^2 = a^2 - b^2$.

9.4 Problem Solving

- 48.** $\frac{x^2}{(40.5)^2} + \frac{y^2}{6^2} = 1$; about 97.9 km

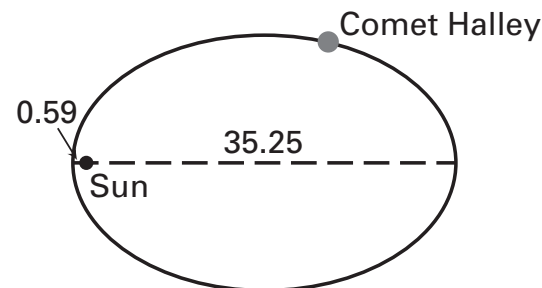
49. $\frac{x^2}{(77.5)^2} + \frac{y^2}{(92.5)^2} = 1$,

$$\frac{x^2}{(55)^2} + \frac{y^2}{(67.5)^2} = 1;$$

about $11,700 \leq A \leq 22,500$

50. $\frac{x^2}{196} + \frac{y^2}{64} = 1$; $4\sqrt{33}$

- 51.**



Sample answer: $\frac{x^2}{21.1} + \frac{y^2}{320.4}$

- 52. a.** *Sample answer:* The sum of
the distances from any point
on the ellipse to each airport
remains constant, in this case
600 miles.

b. $(\pm 225, 0)$

c. 600 mi; $(\pm 300, 0)$

d. about $\frac{x^2}{300^2} + \frac{y^2}{198^2} = 1$

53. $\frac{x^2}{4} + \frac{y^2}{36} = 1$

9.4 Mixed Review

54. 10 **55.** 0

56. -36 **57.** -1

58. $y = -\frac{18}{x}, \frac{9}{2}$

Answers for 9.4 *continued*
For use with pages 637–641

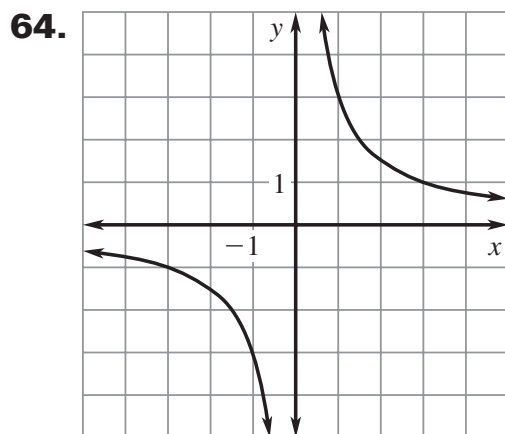
59. $y = \frac{40}{x}; -10$

60. $y = \frac{75}{x}; -\frac{75}{4}$

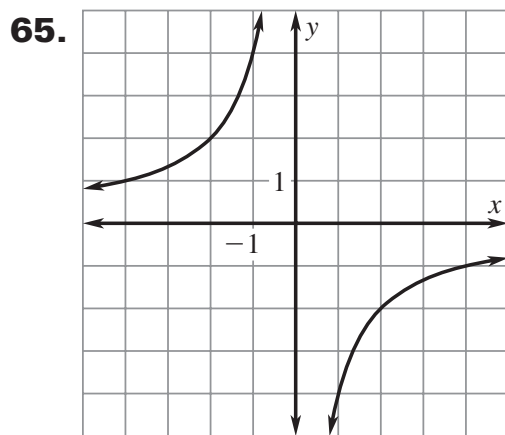
61. $y = -\frac{9}{2x}; \frac{9}{8}$

62. $y = \frac{35}{2x}; -\frac{35}{8}$

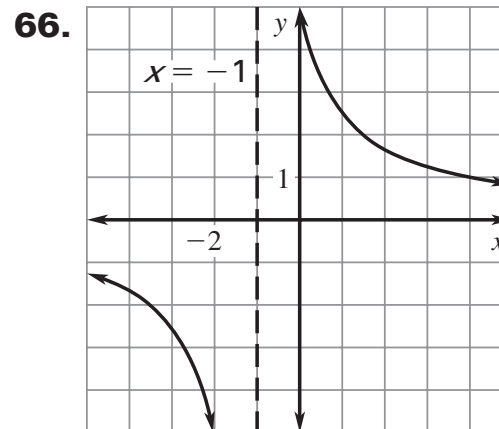
63. $y = \frac{1}{15x}; -\frac{1}{60}$



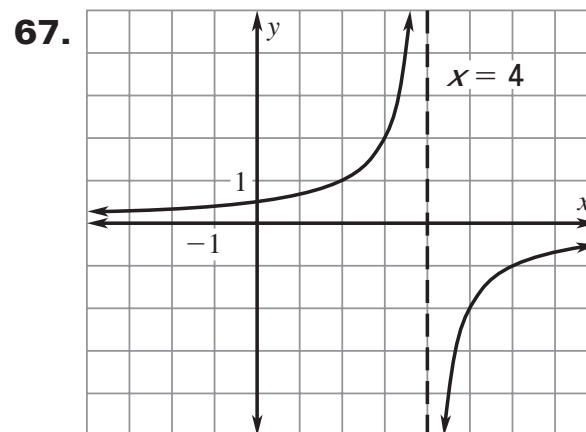
domain: all real numbers
except $x = 0$,
range: all real numbers
except $y = -1$



domain: all real numbers
except $x = 0$,
range: all real numbers
except $y = 0$

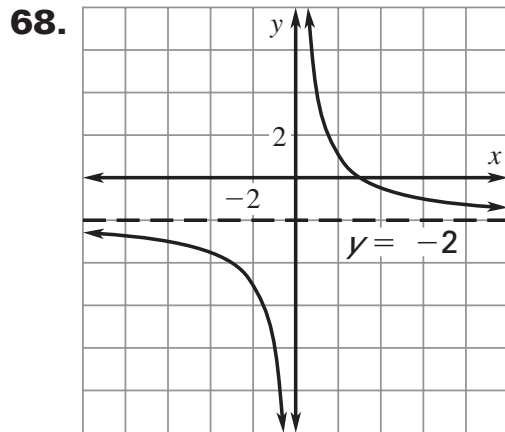


domain: all real numbers
except $x = -1$,
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except $y = 0$

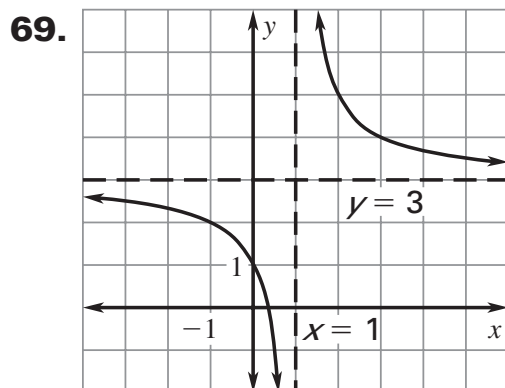


domain: all real numbers
except $x = 4$,
range: all real numbers
except $y = 0$

Answers for 9.4 *continued*
For use with pages 637–641



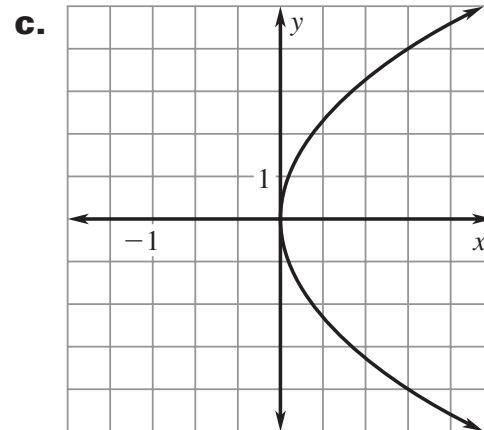
domain: all real numbers
except $x = 0$,
range: all real numbers
except $y = -2$



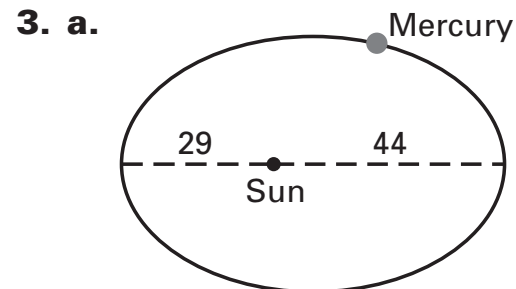
domain: all real numbers
except $x = 1$,
range: all real numbers
except $y = 3$

**9.1–9.4 Mixed Review of
Problem Solving**

- 1. a.** 3.92 in.
b. $y^2 = 15.69x$



- 2. a.** $x^2 + y^2 \leq 256$
b. no
c. about 18.8 mi



- b.** 36.5 million mi, 7.5 million mi
c. *Sample answer:*

$$\frac{x^2}{36.5^2} + \frac{y^2}{35.7^2} = 1$$

- 4.** *Sample answer:* $\frac{x^2}{49} + \frac{y^2}{36} = 1$

Answers for 9.4 *continued*

For use with pages 637–641

5. **a.** about 58.6 m
b. about 20.05 m/sec
c. It increases; as the speed increases, the radius of the circle increases since

$$r = \frac{v^2}{9.8\mu}$$

6. They are perpendicular; the product of their slopes is -1 .

7. *Sample answer:* $y^2 = -\frac{25}{2}x$

8. 20 mi;

		2	0
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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②	②	②	②
③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

9. 2.3 in.;

	2	.	3
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<input type="radio"/>	①	①	①
②	②	②	②
③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨