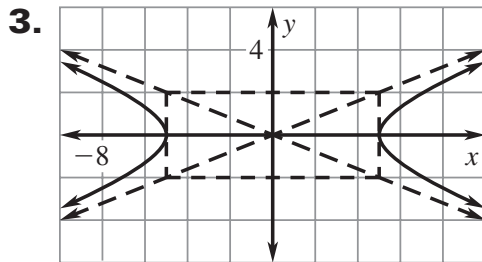


Answers for 9.5

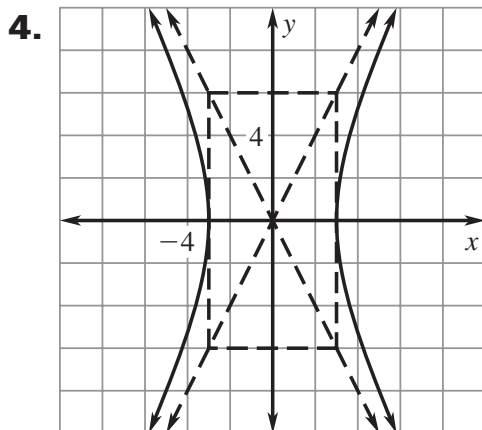
For use with pages 645–648

9.5 Skill Practice

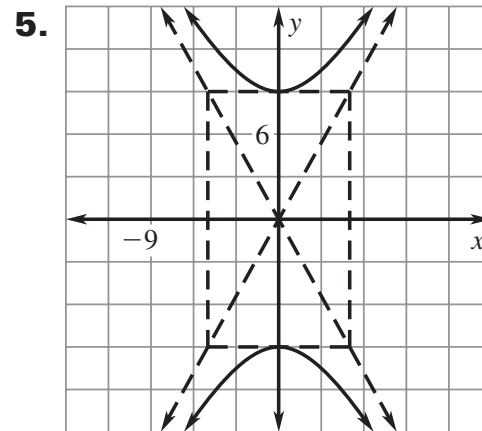
1. vertices, transverse axis
2. In an ellipse the sum of the distances remains constant while in a hyperbola the difference of the distances remains constant.



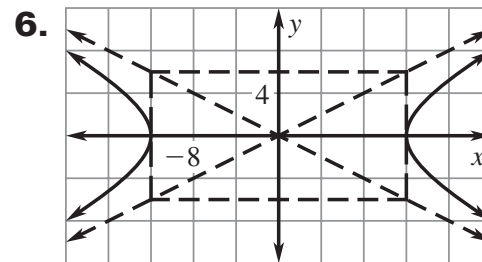
$$(\pm 5, 0), (\pm\sqrt{29}, 0), y = \pm\frac{2}{5}x$$



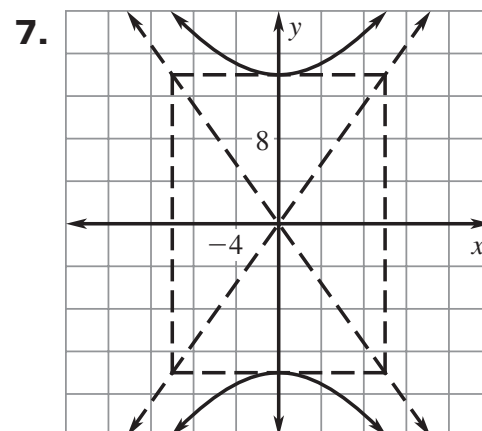
$$(\pm 3, 0), (\pm 3\sqrt{5}, 0), y = \pm 2x$$



$$(0, \pm 9), (0, \pm\sqrt{106}), y = \pm\frac{9}{5}x$$

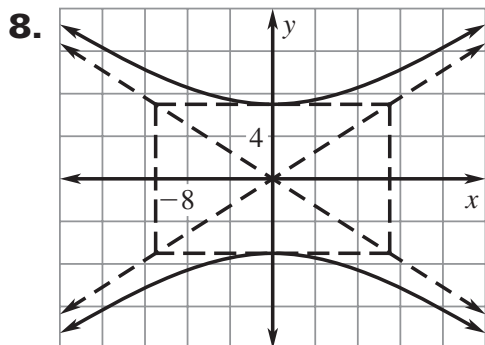


$$(\pm 12, 0), (\pm 6\sqrt{5}, 0), y = \pm\frac{1}{2}x$$

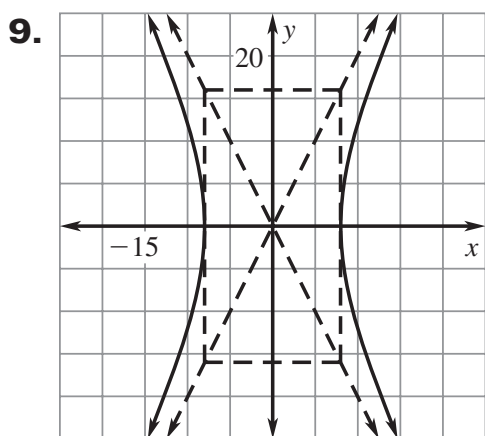


$$(0, \pm 14), (0, \pm 2\sqrt{74}), y = \pm\frac{7}{5}x$$

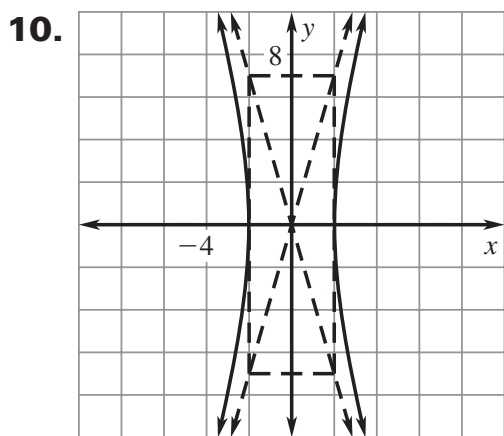
Answers for 9.5 *continued*
For use with pages 645–648



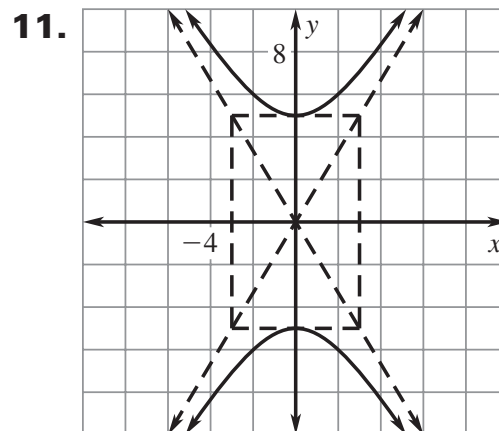
$$(0, \pm 7), (0, \pm \sqrt{170}), y = \pm \frac{7}{11}x$$



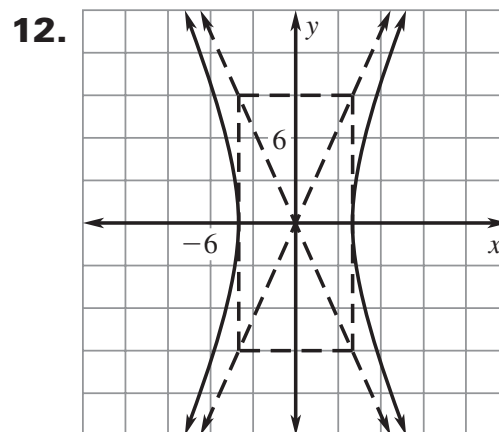
$$(\pm 8, 0), (\pm 8\sqrt{5}, 0), y = \pm 2x$$



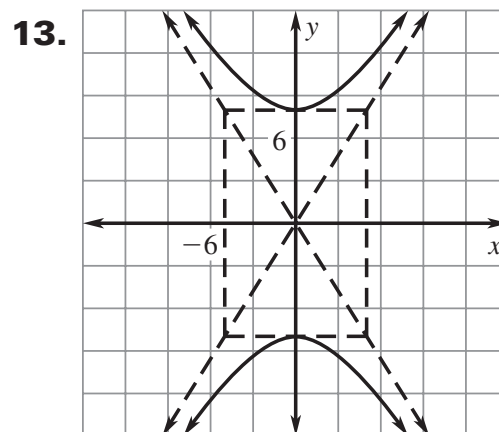
$$(\pm 2, 0), (\pm \sqrt{53}, 0), y = \pm \frac{7}{2}x$$



$$(0, \pm 5), (0, \pm \sqrt{34}), y = \pm \frac{5}{3}x$$

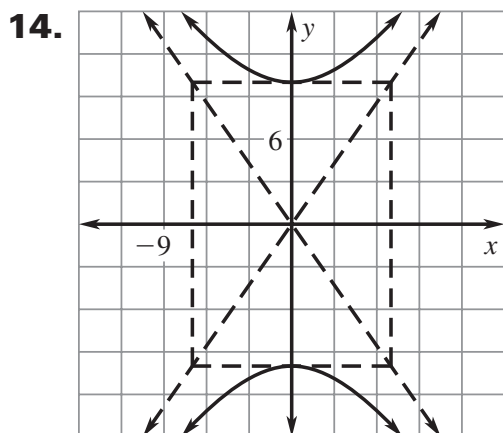


$$(\pm 4, 0), (\pm \sqrt{97}, 0), y = \pm \frac{9}{4}x$$



$$(0, \pm 8), (0, \pm \sqrt{89}), y = \pm \frac{8}{5}x$$

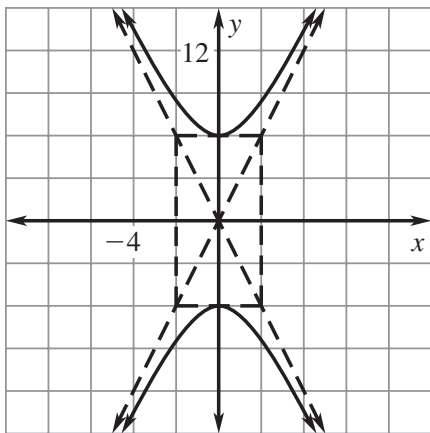
Answers for 9.5 *continued*
For use with pages 645–648



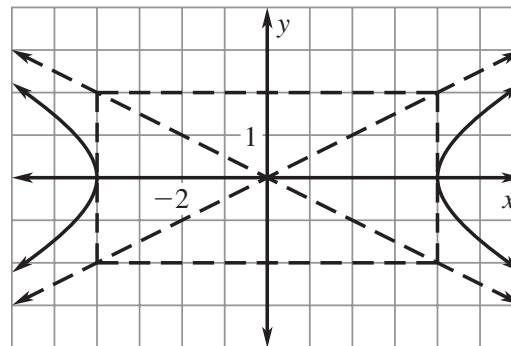
$$(0, \pm 10), (0, \pm \sqrt{149}), y = \pm \frac{10}{7}x$$

15. D

16. The hyperbola should open up/down with vertices $(0, \pm 6)$.



17. The equation of a hyperbola must equal one, so the hyperbola's vertices should be located at $(\pm 4, 0)$.



18. $\frac{y^2}{4} - \frac{x^2}{12} = 1$

19. $\frac{x^2}{4} - \frac{y^2}{32} = 1$

20. $x^2 - \frac{y^2}{24} = 1$

21. $\frac{y^2}{49} - \frac{x^2}{95} = 1$

22. $\frac{x^2}{75} - \frac{y^2}{25} = 1$

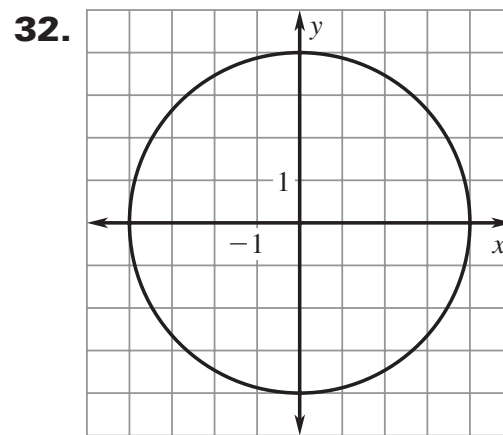
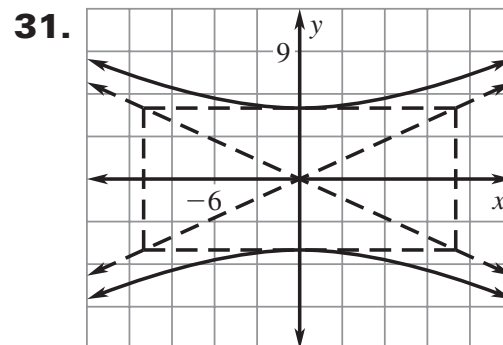
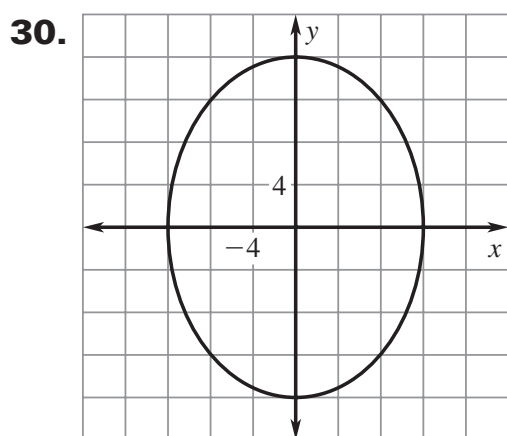
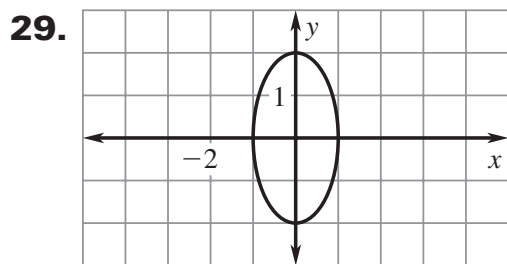
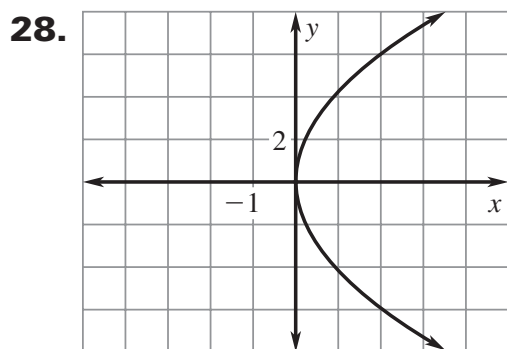
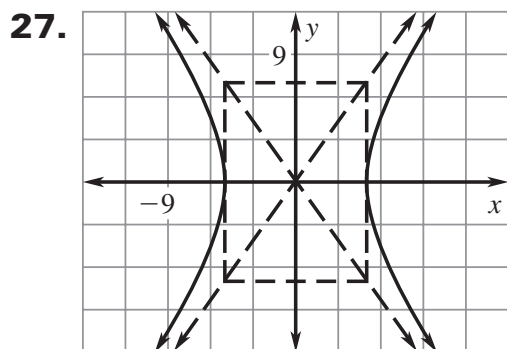
23. $\frac{y^2}{16} - \frac{x^2}{64} = 1$

24. $\frac{y^2}{8} - x^2 = 1$

25. $\frac{x^2}{4} - \frac{y^2}{50} = 1$

26. C

Answers for 9.5 *continued*
For use with pages 645–648



33. **a.** The hyperbola will be narrower, the vertices are the same, but the foci move to $(\pm\sqrt{13}, 0)$.

b. The hyperbola will be wider, the vertices are the same, but the foci move to $(0, \pm\sqrt{41})$.

34. **a.** $y = \pm\sqrt{15 + \frac{x^2}{2}}$

b. $y = \pm\sqrt{\frac{5.5x^2}{8.4} - 5.5}$

c. $y = \pm\sqrt{\frac{5x^2 - 12}{7.5}}$

Answers for 9.5 *continued*

For use with pages 645–648

35. *Sample answer:* $x^2 - \frac{y^2}{4} = 1$,
 $\frac{x^2}{4} - \frac{y^2}{16} = 1$, $\frac{x^2}{9} - \frac{y^2}{36} = 1$;
 as the value of a gets larger the hyperbola is stretched vertically.

36. *Sample answer:* Choose (x, y) to be $(-a, 0)$. $d_1 = 2a + c$ and $d_2 = c$ therefore $|d_2 - d_1| = 2a$.

37. $x^2 - \frac{y^2}{3} = 1$

9.6 Problem Solving

38. $\frac{x^2}{1089} - \frac{y^2}{2047} = 1$

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

40. a. $\frac{x^2}{176.89} - \frac{y^2}{618.35} = 1$

b. $\frac{x^2}{16.81} - \frac{y^2}{608.19} = 1$

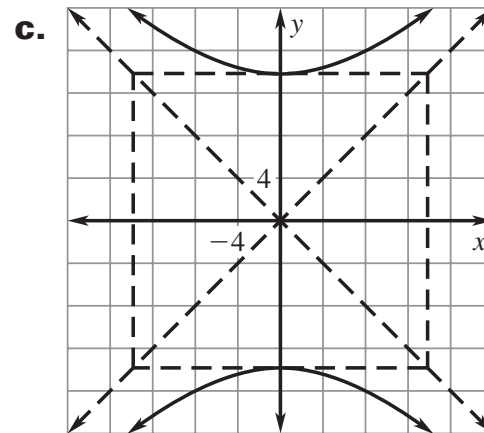
41. a. $(30.5, 0), (85, -40)$

b. $\frac{x^2}{930.25} - \frac{y^2}{236.45} = 1$

c. about 54.6 ft

42. a. $\pi y^2 - \pi x^2 = 600$

b. Sample answer:
 About $(1, 13.9), (3, 14.1),$
 $(6, 15.1), (9, 16.5)$



the part of the hyperbola found in the first quadrant

d. It gets smaller; since the area of concrete remains constant as the radii increases, the width decreases.

43. a. $\frac{x^2}{16} - \frac{y^2}{20} = 1$

b. Sample answer: Choose any point on the graph and observe that the difference of the distances from that point and the foci remains constant.

44. No. *Sample answer:* Using microphones A and B as the foci, there is more than one location for the elk to be located.

9.5 Mixed Review

45. $\begin{bmatrix} 10 & 7 \\ -3 & -6 \end{bmatrix}$

Answers for 9.5 *continued*

For use with pages 645–648

$$46. \begin{bmatrix} -2 & 12 \\ -6 & 9 \\ -40 & 24 \end{bmatrix}$$

47. Not possible; the number of columns in the first matrix is not equal to the number of rows in the second matrix.

$$48. \begin{bmatrix} -12 & -22 & 19 \\ -6 & 4 & 7 \end{bmatrix}$$

$$49. y = (x - 2)^2 + 3; (2, 3)$$

$$50. y = (x - 1)^2 - 6; (1, -6)$$

$$51. y = (x + 7)^2 + 5; (-7, 5)$$

$$52. y = -(x + 4)^2 - 4; (-4, -4)$$

$$53. y = \left(x + \frac{9}{2}\right)^2 - \frac{129}{4}; \left(-\frac{9}{2}, -\frac{129}{4}\right)$$

$$54. y = -2\left(x + \frac{1}{2}\right)^2 - \frac{17}{2}; \left(-\frac{1}{2}, -\frac{17}{2}\right)$$