Review Exercises *(page 482)*

1. $C = 74°$, $b \approx 13.19$, $c \approx 13.41$

2. $C = 37°$, $b \approx 38.90$, $c \approx 27.31$

3. $A = 26°$, $a \approx 24.89$, $c \approx 56.23$

4. $A = 150°$, $a \approx 48.24$, $b \approx 16.75$

5. $C = 66°$, $a \approx 2.53$, $b \approx 9.11$

6. $C = 40°$, $a \approx 162.42$, $b \approx 115.29$

7. $B = 108°$, $a \approx 11.76$, $c \approx 21.49$

8. $A = 80°$, $b \approx 334.95$, $c \approx 219.04$

9. $A \approx 20.41°$, $C \approx 9.59°$, $a \approx 20.92$

10. No solution

11. $B \approx 39.48°$, $C \approx 65.52°$, $c \approx 48.24$

12. Two solutions:
$A \approx 40.92°$, $C \approx 114.08°$, $c \approx 8.64$

$A \approx 139.08°$, $C \approx 15.92°$, $c \approx 2.60$

13. 7.9 **14.** 15.8 **15.** 33.5 **16.** 44.1

17. 31.1 meters **18.** 4.8 **19.** 31.01 feet

20. 586.4 feet **21.** $A \approx 29.69°$, $B \approx 52.41°$, $C \approx 97.90°$

22. $A \approx 53.13°$, $B \approx 36.87°$, $C = 90°$

23. $A \approx 29.92°$, $B \approx 86.18°$, $C \approx 63.90°$

24. $A \approx 101.47°$, $B \approx 31.73°$, $C \approx 46.80°$

25. $A = 35°$, $C = 35°$, $b \approx 6.55$

26. $A \approx 9.90°$, $C \approx 20.10°$, $b \approx 29.09$

27. $A \approx 45.76°$, $B \approx 91.24°$, $c \approx 21.42$

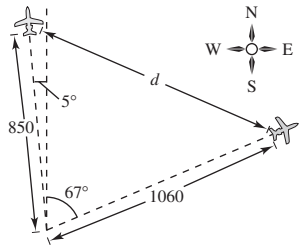
28. $B \approx 35.20°$, $C \approx 82.80°$, $a \approx 17.37$

29. $\approx$ 4.3 feet, $\approx$12.6 feet

30. $\approx$11.3 meters, $\approx$33.5 meters

31. 615.1 meters

32.



1135.5 miles

33. 9.80 **34.** 36.98 **35.** 8.36 **36.** 242.63

37. $\|\mathbf{u}\| = \|\mathbf{v}\| = \sqrt{61}$, $\text{slope}_{\mathbf{u}} = \text{slope}_{\mathbf{v}} = \frac{5}{6}$

38. $\|\mathbf{u}\| = \|\mathbf{v}\| = 2\sqrt{10}$, $\text{slope}_{\mathbf{u}} = \text{slope}_{\mathbf{v}} = -3$

39. $\langle 7, -5 \rangle$ **40.** $\left\langle 6, \frac{5}{2} \right\rangle$ **41.** $\langle 7, -7 \rangle$ **42.** $\langle 14, 4 \rangle$

43. $\left\langle -4, 4\sqrt{3} \right\rangle$ **44.** $\left\langle -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right\rangle$

45. (a) $\langle -4, 3 \rangle$ (b) $\langle 2, -9 \rangle$ (c) $\langle -3, -9 \rangle$
(d) $\langle -11, -3 \rangle$

46. (a) $\langle 4, 4 \rangle$ (b) $\langle 4, 6 \rangle$ (c) $\langle 12, 15 \rangle$
(d) $\langle 20, 23 \rangle$

47. (a) $\langle -1, 6 \rangle$ (b) $\langle -9, -2 \rangle$ (c) $\langle -15, 6 \rangle$
(d) $\langle -17, 18 \rangle$

48. (a) $\langle 4, -10 \rangle$ (b) $\langle -2, -6 \rangle$ (c) $\langle 3, -24 \rangle$
(d) $\langle 11, -44 \rangle$

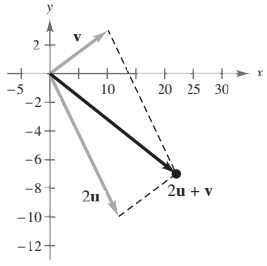
49. (a) $7\mathbf{i} + 2\mathbf{j}$ (b) $-3\mathbf{i} - 4\mathbf{j}$ (c) $6\mathbf{i} - 3\mathbf{j}$
(d) $20\mathbf{i} + \mathbf{j}$

50. (a) $-3\mathbf{i} - 4\mathbf{j}$ (b) $-11\mathbf{i} - 4\mathbf{j}$ (c) $-21\mathbf{i} - 9\mathbf{j}$
(d) $-27\mathbf{i} - 17\mathbf{j}$

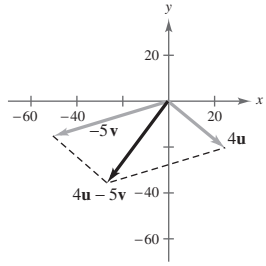
51. (a) $3\mathbf{i} + 6\mathbf{j}$ (b) $5\mathbf{i} - 6\mathbf{j}$ (c) $12\mathbf{i}$ (d) $18\mathbf{i} + 12\mathbf{j}$

52. (a) $\mathbf{i} - 5\mathbf{j}$ (b) $\mathbf{i} - 7\mathbf{j}$ (c) $-18\mathbf{j}$ (d) $2\mathbf{i} - 28\mathbf{j}$

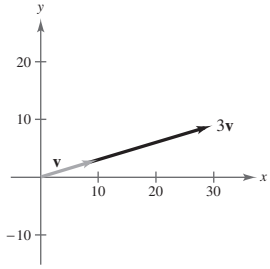
53. $\langle 22, -7 \rangle$



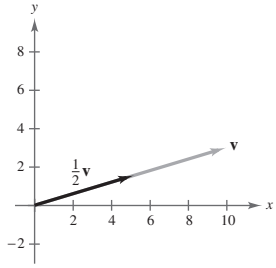
54. $\langle -26, -35 \rangle$



55. $\langle 30, 9 \rangle$



56. $\left\langle 5, \frac{3}{2} \right\rangle$



57. $-3\mathbf{i} + 4\mathbf{j}$ **58.** $-6\mathbf{i} - 8\mathbf{j}$ **59.** $6\mathbf{i} + 4\mathbf{j}$

60. $7\mathbf{i} - 16\mathbf{j}$ **61.** $10\sqrt{2}(\cos 135°\mathbf{i} + \sin 135°\mathbf{j})$

62. $\sqrt{17}(\cos 346°\mathbf{i} + \sin 346°\mathbf{j})$ **63.** $\|\mathbf{v}\| = 7$; $\theta = 60°$

(Continued)

64. $\|\mathbf{v}\| = 3$; $\theta = 150°$ **65.** $\|\mathbf{v}\| = \sqrt{41}$; $\theta = 38.7°$

66. $\|\mathbf{v}\| = \sqrt{65}$; $\theta = 119.7°$ **67.** $\|\mathbf{v}\| = 3\sqrt{2}$; $\theta = 225°$

68. $\|\mathbf{v}\| = \sqrt{65}$; $\theta = 352.9°$

69. The resultant force is 133.92 pounds and 5.6° from the 85-pound force.

70. 180 pounds each **71.** 422.30 miles per hour; 130.4°

72. 740.5 kilometers per hour; 32.1° **73.** 45

74. -140 **75.** -2 **76.** -136 **77.** 50; scalar

78. 5; scalar **79.** $\langle 6, -8\rangle$; vector **80.** -6; scalar

81. $\frac{11\pi}{12}$ **82.** 105° **83.** 160.5° **84.** 22.4°

85. Orthogonal **86.** Parall **87.** Neither

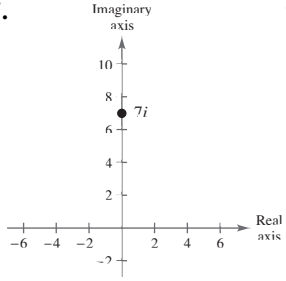
88. Orthogonal **89.** $-\frac{13}{17}\langle 4, 1\rangle, \frac{16}{17}\langle -1, 4\rangle$

90. $\langle 5, 0\rangle, \langle 0, 6\rangle$ **91.** $\frac{5}{2}\langle -1, 1\rangle, \frac{9}{2}\langle 1, 1\rangle$

92. $\frac{25}{29}\langle -5, 2\rangle, \frac{19}{29}\langle 2, 5\rangle$ **93.** 48 **94.** -132

95. 72,000 foot-pounds **96.** 281.9 foot-pounds

97.



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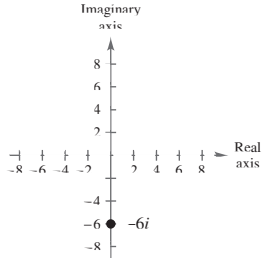
98.



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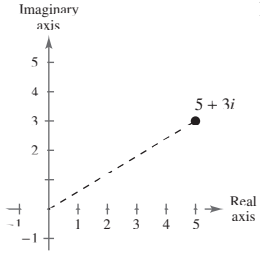
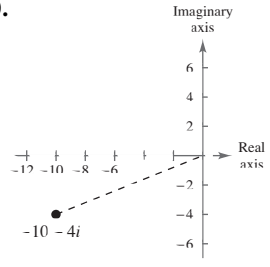
99.



$\sqrt{34}$

100.



$2\sqrt{29}$

101. $5\sqrt{2}\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$

102. $13(\cos 1.176 + i \sin 1.176)$

103. $6\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right)$ **104.** $7(\cos\pi + i\sin\pi)$

105. (a) $z_1 = 4\left(\cos\frac{11\pi}{6} + i\sin\frac{11\pi}{6}\right)$

$z_2 = 10\left(\cos\frac{3\pi}{2} + i\sin\frac{3\pi}{2}\right)$

(b) $z_1 z_2 = 40\left(\cos\frac{10\pi}{3} + i\sin\frac{10\pi}{3}\right)$

$\frac{z_1}{z_2} = \frac{2}{5}\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$

106. (a) $z_1 = 3\sqrt{2}\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$

$z_2 = 4\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

(b) $z_1 z_2 = 12\sqrt{2}\left(\cos\frac{17\pi}{12} + i\sin\frac{17\pi}{12}\right)$

$\frac{z_1}{z_2} = \frac{3\sqrt{2}}{4}\left(\cos\frac{13\pi}{12} + i\sin\frac{13\pi}{12}\right)$

107. $\frac{625}{2} + \frac{625\sqrt{3}}{2}i$ **108.** $-16 - 16\sqrt{3}i$

109. $2035 - 828i$ **110.** 16

111. (a) $3\left(\cos\frac{\pi}{4} + i\sin\frac{\pi}{4}\right)$

$3\left(\cos\frac{7\pi}{12} + i\sin\frac{7\pi}{12}\right)$

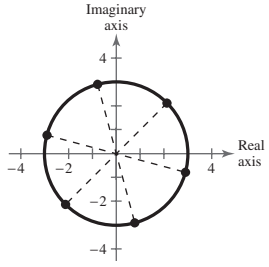
$3\left(\cos\frac{11\pi}{12} + i\sin\frac{11\pi}{12}\right)$

$3\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$

$3\left(\cos\frac{19\pi}{12} + i\sin\frac{19\pi}{12}\right)$

$3\left(\cos\frac{23\pi}{12} + i\sin\frac{23\pi}{12}\right)$

(b)



(c) $\frac{3\sqrt{2}}{2} + \frac{3\sqrt{2}}{2}i, -0.7765 + 2.898i,$

$-2.898 + 0.7765i, -\frac{3\sqrt{2}}{2} - \frac{3\sqrt{2}}{2}i,$

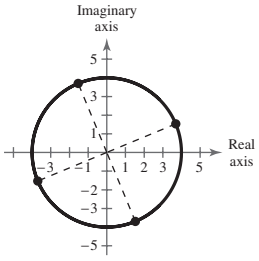
$0.7765 - 2.898i, 2.898 - 0.7765i$

112. (a) $4\left(\cos\frac{\pi}{8} + i\sin\frac{\pi}{8}\right)$ $4\left(\cos\frac{5\pi}{8} + i\sin\frac{5\pi}{8}\right)$

$4\left(\cos\frac{9\pi}{8} + i\sin\frac{9\pi}{8}\right)$ $4\left(\cos\frac{13\pi}{8} + i\sin\frac{13\pi}{8}\right)$

(Continued)

(b)



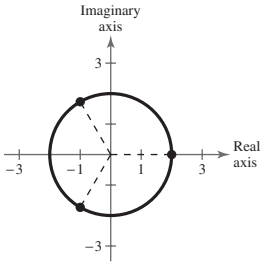
(c) $3.696 + 1.531i, -1.531 + 3.696i,$
$-3.696 - 1.531i, 1.531 - 3.696i$

113. (a) $2(\cos 0 + i \sin 0)$

$$2\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)$$

$$2\left(\cos\frac{4\pi}{3} + i\sin\frac{4\pi}{3}\right)$$

(b)



(c) $2, -1 + \sqrt{3}i, -1 - \sqrt{3}i$

114. (a) $4\left(\cos\frac{\pi}{5} + i\sin\frac{\pi}{5}\right)$

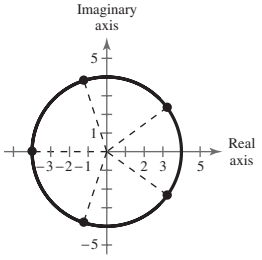
$$4\left(\cos\frac{3\pi}{5} + i\sin\frac{3\pi}{5}\right)$$

$$4(\cos\pi + i\sin\pi)$$

$$4\left(\cos\frac{7\pi}{5} + i\sin\frac{7\pi}{5}\right)$$

$$4\left(\cos\frac{9\pi}{5} + i\sin\frac{9\pi}{5}\right)$$

(b)



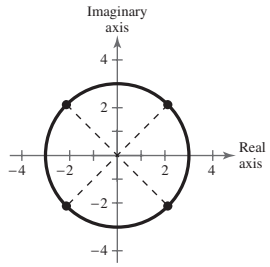
(c) $3.236 + 2.351i, -1.236 + 3.804i, -4,$
$-1.236 - 3.804i, 3.236 - 2.351i$

115. $3\left(\cos\frac{\pi}{4} + i\sin\frac{\pi}{4}\right) = \frac{3\sqrt{2}}{2} + \frac{3\sqrt{2}}{2}i$

$$3\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right) = -\frac{3\sqrt{2}}{2} + \frac{3\sqrt{2}}{2}i$$

$$3\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right) = -\frac{3\sqrt{2}}{2} - \frac{3\sqrt{2}}{2}i$$

$$3\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right) = \frac{3\sqrt{2}}{2} - \frac{3\sqrt{2}}{2}i$$



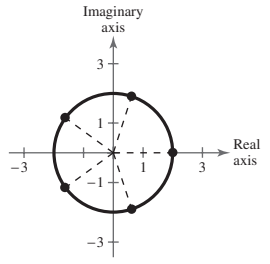
116. $2(\cos 0 + i \sin 0) = 2$

$$2\left(\cos\frac{2\pi}{5} + i\sin\frac{2\pi}{5}\right) = 0.6180 + 1.9021i$$

$$2\left(\cos\frac{4\pi}{5} + i\sin\frac{4\pi}{5}\right) = -1.6180 + 1.1756i$$

$$2\left(\cos\frac{6\pi}{5} + i\sin\frac{6\pi}{5}\right) = -1.6180 - 1.1756i$$

$$2\left(\cos\frac{8\pi}{5} + i\sin\frac{8\pi}{5}\right) = 0.6180 - 1.9021i$$



117. $2\left(\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}\right) = 2i$

$$2\left(\cos\frac{7\pi}{6} + i\sin\frac{7\pi}{6}\right) = -\sqrt{3} - i$$

$$2\left(\cos\frac{11\pi}{6} + i\sin\frac{11\pi}{6}\right) = \sqrt{3} - i$$

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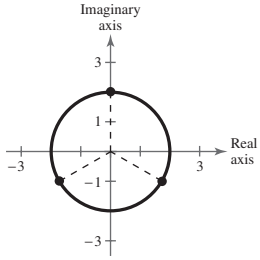


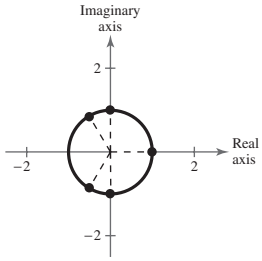
118. $\cos 0 + i \sin 0 = 1$

$$\cos\frac{\pi}{2} + i\sin\frac{\pi}{2} = i$$

$$\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3} = -\frac{1}{2} + \frac{\sqrt{3}}{2}i$$

$$\cos\frac{4\pi}{3} + i\sin\frac{4\pi}{3} = -\frac{1}{2} - \frac{\sqrt{3}}{2}i$$

$$\cos\frac{3\pi}{2} + i\sin\frac{3\pi}{2} = -i$$



119. True. sin 90° is defined in the Law of Sines.

120. False. There may be no solution, one solution, or two solutions.

121. True. By definition, $\mathbf{u} = \dfrac{\mathbf{v}}{\|\mathbf{v}\|}$, so $\mathbf{v} = \|\mathbf{v}\|\mathbf{u}$.

122. False. If $\mathbf{v} = a\mathbf{i} + b\mathbf{j} = \mathbf{0}$, then $a = b = 0$.

123. False. The solutions to $x^2 - 8i = 0$ are $x = 2 + 2i$ and $x = -2 - 2i$.

124. $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

125. $a^2 = b^2 + c^2 - 2bc\cos A$, $b^2 = a^2 + c^2 - 2ac\cos B$, $c^2 = a^2 + b^2 - 2ab\cos C$

126. Direction and magnitude **127.** **A** and **C**

128. a; The angle between the vectors is acute.

129. If $k > 0$, the direction is the same and the magnitude is k times as great.

If $k < 0$, the result is a vector in the opposite direction and the magnitude is $|k|$ times as great.

130. The diagonal of the parallelogram with **u** and **v** as its adjacent sides

131. (a) $4(\cos 60° + i \sin 60°)$ (b) -64
$4(\cos 180° + i \sin 180°)$
$4(\cos 300° + i \sin 300°)$

132. (a) $4(\cos 60° + i \sin 60°)$ (b) $-128 - 128\sqrt{3}i$
$4(\cos 150° + i \sin 150°)$
$4(\cos 240° + i \sin 240°)$
$4(\cos 330° + i \sin 330°)$

133. $z_1 z_2 = -4$; $\dfrac{z_1}{z_2} = \cos(2\theta - \pi) + i\sin(2\theta - \pi)$
$= -\cos 2\theta - i \sin 2\theta$

134. (a) 3 roots

(b) On the circle 120°, 210°, and 300° from the positive x-axis

Chapter Test *(page 486)*

1. $C = 88°$, $b \approx 27.81$, $c \approx 29.98$

2. $A = 43°$, $b \approx 25.75$, $c \approx 14.45$

3. Two solutions:

$B \approx 29.12°$, $C \approx 126.88°$, $c \approx 22.03$

$B \approx 150.88°$, $C \approx 5.12°$, $c \approx 2.46$

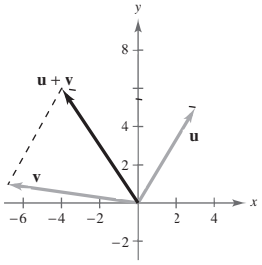
4. No solution **5.** $A \approx 39.96°$, $C \approx 40.04°$, $c \approx 15.02$

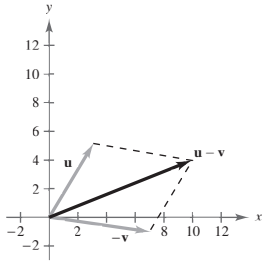
6. $A \approx 23.43°$, $B \approx 33.57°$, $c \approx 86.46$

7. 2052.5 square meters **8.** 606.3 miles; 29.1°

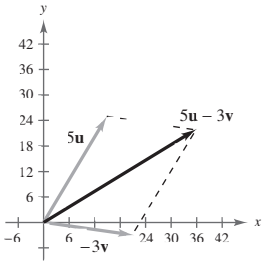
9. $\langle 14, -23 \rangle$ **10.** $\left\langle \frac{18\sqrt{34}}{17}, -\frac{30\sqrt{34}}{17} \right\rangle$

11. $\langle -4, 6 \rangle$ **12.** $\langle 10, 4 \rangle$





13. $\langle 36, 22 \rangle$ **14.** $\left\langle \frac{4}{5}, -\frac{3}{5} \right\rangle$



15. 14.9°; 250.15 pounds **16.** 135° **17.** No

18. $\frac{37}{26}\langle 5, 1 \rangle; \frac{29}{26}\langle -1, 5 \rangle$ **19.** ≈ 104 pounds

20. $5\sqrt{2}\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$ **21.** $-3 + 3\sqrt{3}i$

22. $-\frac{6561}{2} - \frac{6561\sqrt{3}}{2}i$ **23.** $5832i$

24. $4\sqrt[4]{2}\left(\cos\frac{\pi}{12} + i\sin\frac{\pi}{12}\right)$

$4\sqrt[4]{2}\left(\cos\frac{7\pi}{12} + i\sin\frac{7\pi}{12}\right)$

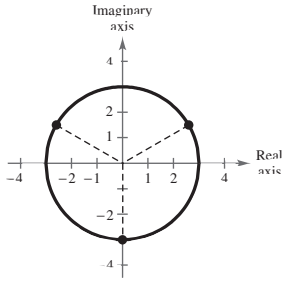
$4\sqrt[4]{2}\left(\cos\frac{13\pi}{12} + i\sin\frac{13\pi}{12}\right)$

$4\sqrt[4]{2}\left(\cos\frac{19\pi}{12} + i\sin\frac{19\pi}{12}\right)$

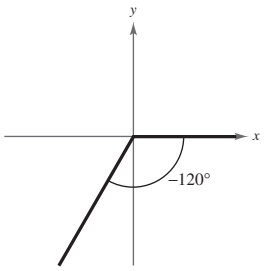
25. $3\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

$3\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right)$

$3\left(\cos\frac{3\pi}{2} + i\sin\frac{3\pi}{2}\right)$



Cumulative Test for Chapters 4–6 *(page 487)*

1. (a) 

(b) 240°

(c) $-\frac{2\pi}{3}$

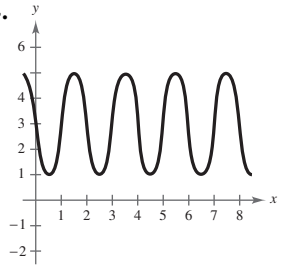
(d) 60°

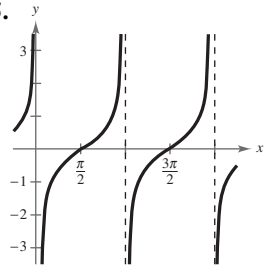
(e) $\sin(-120°) = -\frac{\sqrt{3}}{2}$ $\quad \csc(-120°) = -\frac{2\sqrt{3}}{3}$

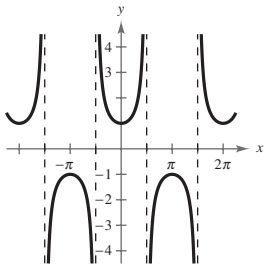
$\cos(-120°) = -\frac{1}{2}$ $\quad \sec(-120°) = -2$

$\tan(-120°) = \sqrt{3}$ $\quad \cot(-120°) = \frac{\sqrt{3}}{3}$

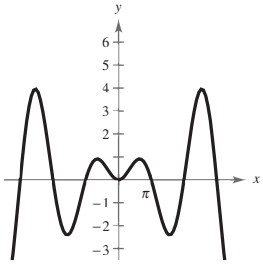
2. 134.6° **3.** $\frac{3}{5}$

4. 

5. 

6. 

7. $a = -3, b = \pi, c = 0$

8. 

9. 6.7 **10.** $\frac{3}{4}$

11. $\sqrt{1 - 4x^2}$ **12.** 1 **13.** $2 \tan \theta$

14–16. Answers will vary. **17.** $\frac{\pi}{3}, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{3}$

18. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ **19.** $\frac{3\pi}{2}$ **20.** $\frac{16}{63}$ **21.** $\frac{4}{3}$

22. $\frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5}$ **23.** $\frac{5}{2}\left(\sin\frac{5\pi}{2} - \sin\pi\right)$

24. $2 \cos 6x \cos 2x$

25. $B \approx 26.39°, C \approx 123.61°, c \approx 15.0$

26. $B \approx 52.48°, C \approx 97.52°, a \approx 5.04$

27. $B = 60°, a \approx 5.77, c \approx 11.55$

28. $A = 26.38°, B \approx 62.72°, C \approx 90.90°$

29. 36.4 square inches **30.** 85.2 square inches

31. $3\mathbf{i} + 5\mathbf{j}$ **32.** $\left\langle \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$ **33.** -5

34. $-\frac{1}{13}\langle 1, 5\rangle; \frac{21}{13}\langle 5, -1\rangle$ **35.** $2\sqrt{2}\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$

36. $-12\sqrt{3} + 12i$

37. $\cos 0 + i \sin 0 = 1$

$\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3} = -\frac{1}{2} + \frac{\sqrt{3}}{2}i$

$\cos\frac{4\pi}{3} + i\sin\frac{4\pi}{3} = -\frac{1}{2} - \frac{\sqrt{3}}{2}i$

38. $3\left(\cos\frac{\pi}{5} + i\sin\frac{\pi}{5}\right)$

$3\left(\cos\frac{3\pi}{5} + i\sin\frac{3\pi}{5}\right)$

$3(\cos\pi + i\sin\pi)$

$3\left(\cos\frac{7\pi}{5} + i\sin\frac{7\pi}{5}\right)$

$3\left(\cos\frac{9\pi}{5} + i\sin\frac{9\pi}{5}\right)$

39. $\approx$ 395.8 radians per minute; $\approx$ 8312.6 inches per minute

40. Area = 63.67 square yards

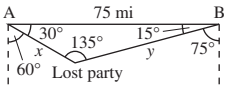
41. 5 feet **42.** 22.6° **43.** $d = 4\cos\frac{\pi}{4}t$

44. 32.6°; 543.9 kilometers per hour **45.** 425 foot-pounds

Problem Solving *(page 493)*

1. 2.01 feet **2.** S 22.09° E; 1025.88 yards

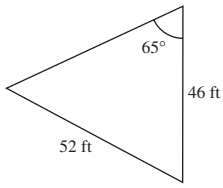
3. (a)



(b) Station A: 27.45 miles; Station B: 53.03 miles

(c) 11.03 miles; S 21.7° E

4. (a)



(b) 50.5 feet

(c) 22 bags

5. (a) (i) $\sqrt{2}$ (ii) $\sqrt{5}$ (iii) 1
(iv) 1 (v) 1 (vi) 1

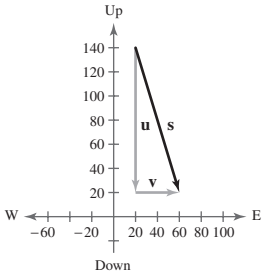
(b) (i) 1 (ii) $3\sqrt{2}$ (iii) $\sqrt{13}$
(iv) 1 (v) 1 (vi) 1

(c) (i) $\frac{\sqrt{5}}{2}$ (ii) $\sqrt{13}$ (iii) $\frac{\sqrt{85}}{2}$
(iv) 1 (v) 1 (vi) 1

(d) (i) $2\sqrt{5}$ (ii) $5\sqrt{2}$ (iii) $5\sqrt{2}$
(iv) 1 (v) 1 (vi) 1

6. (a) $\mathbf{u} = \langle 0, -120 \rangle$, $\mathbf{v} = \langle 40, 0 \rangle$

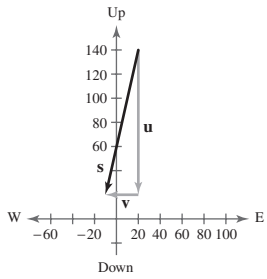
(b)



(c) 126.5 miles per hour; The magnitude gives the velocity of the skydiver's fall.

(d) 108.43°

(e) 123.7 miles per hour

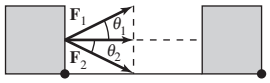


7. $\mathbf{w} = \frac{1}{2}(\mathbf{u} + \mathbf{v})$; $\mathbf{w} = \frac{1}{2}(\mathbf{v} - \mathbf{u})$

8. $\mathbf{u} \cdot \mathbf{v} = 0$ and $\mathbf{u} \cdot \mathbf{w} = 0$

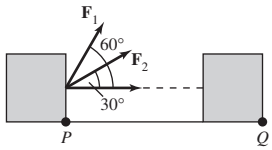
$\mathbf{u} \cdot (c\mathbf{v} + d\mathbf{w})$
$= \mathbf{u} \cdot c\mathbf{v} + \mathbf{u} \cdot d\mathbf{w}$
$= c(\mathbf{u} \cdot \mathbf{v}) + d(\mathbf{u} \cdot \mathbf{w})$
$= 0$

9. (a)



The amount of work done by $\mathbf{F}_1$ is equal to the amount of work done by $\mathbf{F}_2$.

(b)



The amount of work done $\mathbf{F}_2$ is $\sqrt{3}$ times as great as the amount of work done by $\mathbf{F}_1$.

10. (a)

θ	0.5°	1.0°	1.5°
$\|\mathbf{v}\| \sin \theta$	0.873	1.745	2.618
$\|\mathbf{v}\| \cos \theta$	99.996	99.985	99.966

θ	2.0°	2.5°	3.0°
$\|\mathbf{v}\| \sin \theta$	3.490	4.362	5.234
$\|\mathbf{v}\| \cos \theta$	99.939	99.905	99.863

(b) No. Find the square root of the sum of the squares of the vertical and horizontal components.

(c) (i) 150 miles per hour
(ii) 150 miles per hour