

4.1 Angles in Radians and Degrees

Answers

1. $\frac{2\pi}{3}$

2. $\frac{5\pi}{6}$

3. $\frac{\pi}{2}$

4. $\frac{11\pi}{12}$

5. $\frac{3\pi}{2}$

6. $\frac{\pi}{4}$

7. $\frac{\pi^2}{36}$

8. 210°

9. 225°

10. 270°

11. 300°

12. 180°

13. 30°

14. $\frac{540}{\pi}^\circ$

15. There are 360 degrees and 2π radians in a circle. Therefore, each degree is $\frac{\pi}{180}$ radians.

4.2 Circular Motion and Dimensional Analysis

Answers

1. 600π in/min
2. 0.25 feet
3. 7.639 rpm
4. 1.91 feet
5. 40.212 in/sec
6. 0.239 rpm
7. 5.14 mi/hr
8. 63.03 feet
9. 672.27 rpm
10. 62.07 rpm
11. 23.8 mph
12. 1008.41 revolutions
13. 377.0 inches/sec
14. 336.14 rpm
15. 188.5 feet

4.3 Special Right Triangles

Answers

1. The other sides are 3 and $3\sqrt{2}$.
2. The other sides are 7.2 and $7.2\sqrt{2}$.
3. The other sides are each $8\sqrt{2}$.
4. The other sides are $5\sqrt{2}$ and 10.
5. The other sides are $3\sqrt{6}$ and $6\sqrt{2}$.
6. The other sides are $\frac{4\sqrt{3}}{3}$ and $\frac{8\sqrt{3}}{3}$.
7. The other sides are 7.5 and $7.5\sqrt{3}$.
8. The other sides are $6\sqrt{3}$ and 18.
9. The 67.38° angle.
10. The side labeled 13.
11. The 22.62° angle.
12. 10 and $10\sqrt{3}$.
13. They are each $\frac{3\sqrt{2}}{2}$.
14. $3^2 + 4^2 = 25 = 5^2$
15. $5^2 + 12^2 = 169 = 13^2$
16. $7^2 + 24^2 = 625 = 25^2$
17. $8^2 + 15^2 = 289 = 17^2$
18. $9^2 + 40^2 = 1681 = 41^2$
19. $6^2 + 8^2 = 100 = 10^2$
20. Answers vary.

4.4 Right Triangle Trigonometry

Answers

1. $a = 8.1, C = 60.3^\circ, B = 29.7^\circ$
2. $B = 43^\circ, c = 10.8, b = 14.4$
3. $A = 75^\circ, c = 8.3, a = 30.9$
4. $b = 9.2, A = 33.1^\circ, B = 56.4^\circ$
5. $C = 78^\circ, b = 4.0, c = 18.6$
6. $a = 13.7, A = 54.0, C = 36.0$
7. $C = 80^\circ, a = 11.5, c = 11.3$
8. $C = 86^\circ, b = 4.3, c = 4.29$
9. $B = 0.6 \text{ radian}, a = 17.8, b = 9.6$
10. $c = 9, C = 0.6 \text{ radian}, A = 0.9 \text{ radian}$
11. $a = 10.7, A = 0.9 \text{ radian}, B = 0.7 \text{ radian}$
12. $C = \frac{\pi}{2} \text{ radian}, a = 5, c = 5\sqrt{2}$
13. $B = \frac{\pi}{6}, C = \frac{\pi}{3}, c = 13\sqrt{3}$
14. $a = 10.2, A = 0.6 \text{ radian}, C = 1.0 \text{ radian}$
15. $A = \frac{\pi}{4} \text{ radian}, B = \frac{\pi}{4} \text{ radian}, b = 10$

4.5 Law of Cosines

Answers

1. 94.9°
2. 48.3°
3. 36.8°
4. You can use the Law of Cosines or the Triangle Sum Theorem
5. 97.9°
6. 29.7°
7. 52.4°
8. 15.6
9. 86.0°
10. 39.0°
11. The Law of Cosines is the same as the Pythagorean Theorem for right triangles because $\cos 90^\circ = 0$.
12. SSS and SAS
13. No (triangle inequality theorem)
14. No (triangle inequality theorem)
15. Yes

4.6 Law of Sines

Answers

1. Two triangles
2. One triangle
3. Two triangles
4. 47°
5. 63.6° or 116.4°
6. 58.6° or 121.5°
7. 63.5°
8. 17.4
9. 3.3
10. 5.6
11. 17.2
12. 14.2
13. $6.3 < a < 10$
14. $a < 6.3$
15. $a = 6.3$ or $a \geq 10$

4.7 Area of a Triangle

Answers

1. 91.6 square units
2. 13.6 square units
3. 403.8 square units
4. 10.4 square units
5. 7.2 square units
6. 11.2 square units
7. 13.6 square units
8. 4.3 square units
9. 17.3 square units
10. 18.8 square units
11. 72.3 square units
12. 48.6°
13. 41.1°
14. 45.3°
15. 22.9°

4.8 Applications of Basic Triangle Trigonometry

Answers

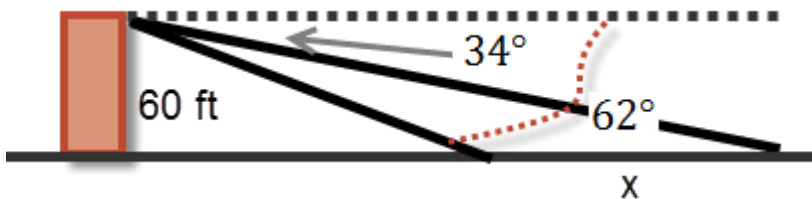
1.



2. Find the angle in the triangle (complementary angles) and then use tangent.

3. 249.8 feet

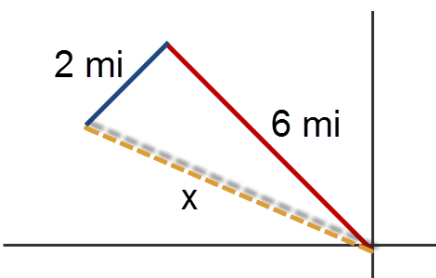
4.



5. Tangent

6. 57.05 feet

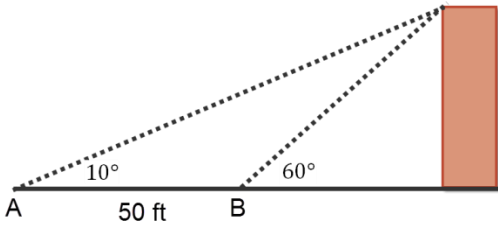
7.



8. This is a right triangle, so you can use the Pythagorean Theorem

9. 6.32 miles

10.



11. Two tangent equations to solve for the distance from B to the building, then substitute to solve for the height.
12. 9.8 feet
13. 5.32 in
14. 10.48 in
15. 10.35 in