

8.1 Expressions with Radicals

Answers

1. $4\sqrt{3}$

2. $4\sqrt{5}$

3. $2\sqrt{6}$

4. 108

5. $32\sqrt{5}$

6. 120

7. $8\sqrt{5}$

8. $\frac{2\sqrt{30}}{3}$

9. $\frac{6\sqrt{10}}{5}$

10. $\frac{7\sqrt{3}}{9}$

8.2 Pythagorean Theorem and Pythagorean Triples

Answers

1. $\sqrt{505}$
2. $9\sqrt{5}$
3. $\sqrt{799}$
4. 12
5. 10
6. $10\sqrt{14}$
7. 26
8. $3\sqrt{41}$
9. $16\sqrt{2}$
10. $9\sqrt{2}$
11. Yes
12. No
13. No
14. Yes
15. Yes
16. No
17. Yes
18. Yes
19. No
20. Yes
21. No
22. Yes

8.3 Applications of the Pythagorean Theorem

Answers

1. $2\sqrt{39}$
2. $\sqrt{429}$
3. $\sqrt{253}$
4. $4\sqrt{5}$
5. $\sqrt{493}$
6. $5\sqrt{10}$
7. 20.6" x 36.6"
8. 25.2" x 33.6"
9. acute
10. right
11. obtuse
12. right
13. acute
14. acute
15. right
16. obtuse
17. obtuse
18. acute
19. obtuse
20. right
21. right

8.4 Inscribed Similar Triangles

Answers

1. $\triangle BAD \sim \triangle ACD \sim \triangle BCA$

2. $\frac{BC}{AC} = \frac{AC}{CD}$

3. $\frac{BC}{AB} = \frac{AB}{BD}$

4. $\frac{CD}{AD} = \frac{AD}{BD}$

5. $\triangle EHG \sim \triangle HFG \sim \triangle EFH$

6. $\triangle KLM \sim \triangle KJL \sim \triangle LJM$

7. $\triangle KML \sim \triangle JML \sim \triangle JKL$

8. $6\sqrt{3}$

9. $6\sqrt{7}$

10. $3\sqrt{21}$

11. $x = 12\sqrt{5}$

12. $y = 5\sqrt{5}$

13. $z = 9\sqrt{2}$

14. $x = 4$

15. $y = \sqrt{465}$

16. $z = 14\sqrt{5}$

17. $x = 9.6$

18. $y = \frac{-21 + \sqrt{637}}{2} \approx 2.12$ (y cannot be negative, so $\frac{-21 - \sqrt{637}}{2}$ isn't an answer)

19. $z = 8\sqrt{2}$

20. $x = \frac{32}{5}$, $y = \frac{8\sqrt{41}}{5} \approx 10.25$, $z = 2\sqrt{41} \approx 12.81$

21. $x = 9, y = 3\sqrt{34}$

22. $x = \frac{9\sqrt{481}}{20} \approx 9.87, y = \frac{81}{40}, z = 40$

23.

Statement	Reason
1. $\triangle ABD$ with $\overline{AC} \perp \overline{DB}$ and $\angle DAB$ is a right angle.	Given
2. $\angle DCA$ and $\angle ACB$ are right angles	Definition of perpendicular lines.
3. $\angle DAB \cong \angle DCA \cong \angle ACB$	All right angles are congruent.
4. $\angle D \cong \angle D$	Reflexive PoC
5. $\triangle CAD \cong \triangle ABD$	AA Similarity Postulate
6. $\angle B \cong \angle B$	Reflexive PoC
7. $\triangle CBA \cong \triangle ABD$	AA Similarity Postulate
8. $\triangle CAD \cong \triangle CBA$	Transitive PoC

8.5 45-45-90 Right Triangles

Answers

1. $4\sqrt{2}$

2. $x\sqrt{2}$

3. $15\sqrt{2}$

4. $11\sqrt{2}$

5. $a = 2\sqrt{2}, b = 2$

6. $c = 6\sqrt{2}, d = 12$

7. $e = f = 13\sqrt{2}$

8. $q = 14, p = 14\sqrt{2}$

9. $x = w = 9\sqrt{2}$

10. $s = 2\sqrt{2}, t = 4$

11. $f = g = \frac{15\sqrt{2}}{2}$ or $7.5\sqrt{2}$

8.6 30-60-90 Right Triangles

Answers

1. $b = 5\sqrt{3}, h = 10$

2. $b = x\sqrt{3}, h = 2x$

3. 12

4. $10\sqrt{3}$

5. $g = 10\sqrt{3}, h = 20$

6. $k = 12, j = 12\sqrt{3}$

7. $x = 11\sqrt{3}, y = 22\sqrt{3}$

8. $m = 9, n = 18$

9. $t = 3\sqrt{3}, s = 9$

10. $a = 9\sqrt{3}, b = 18\sqrt{3}$

11. $q = 6\sqrt{3}, p = 18$

12. $v = 15, w = 10\sqrt{3}$

8.7 Sine, Cosine, and Tangent

Answers

1. $\tan D = \frac{\text{opposite}}{\text{adjacent}} = \frac{d}{f}$

2. $\sin F = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{f}{e}$

3. $\tan F = \frac{\text{opposite}}{\text{adjacent}} = \frac{f}{d}$

4. $\cos F = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{d}{e}$

5. $\sin D = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{d}{e}$

6. $\cos D = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{f}{e}$

7. $\cos D = \sin F$ and $\sin D = \cos F$

8. reciprocals

9. $\sin A = \frac{\sqrt{2}}{2}$, $\cos A = \frac{\sqrt{2}}{2}$, $\tan A = 1$

10. $\sin A = \frac{1}{3}$, $\cos A = \frac{2\sqrt{2}}{3}$, $\tan A = \frac{\sqrt{2}}{4}$

11. $\sin A = \frac{4}{5}$, $\cos A = \frac{3}{5}$, $\tan A = \frac{4}{3}$

12. $\sin A = \frac{1}{2}$, $\cos A = \frac{\sqrt{3}}{2}$, $\tan A = \frac{\sqrt{3}}{3}$

13. $\sin A = \frac{8}{17}$, $\cos A = \frac{15}{17}$, $\tan A = \frac{8}{15}$

8.8 Trigonometric Ratios with a Calculator

Answers

1. $\sin 24^\circ \approx 0.4067$
2. $\cos 45^\circ \approx 0.7071$
3. $\tan 88^\circ \approx 28.6363$
4. $\sin 43^\circ \approx 0.6820$
5. $\tan 12^\circ \approx 0.2126$
6. $\cos 79^\circ \approx 0.1908$
7. $\sin 82^\circ \approx 0.9903$
8. $x \approx 9.4, y \approx 17.7$
9. $x \approx 14.1, y \approx 19.4$
10. $x \approx 20.8, y \approx 22.3$
11. $x \approx 19.3, y \approx 5.2$

8.9 Trigonometry Word Problems

Answers

1. $x \approx 435.9$ ft.
2. $x = 56$ meters
3. 47.6°
4. 1.6°
5. 44°
6. 125 ft
7. 0.54°
8. 39.29°
9. 306.42 ft
10. 56.25°

8.10 Inverse Trigonometric Ratios

Answers

- $m\angle A = \sin^{-1}\left(\frac{10}{18}\right) = 33.7^\circ$
- $m\angle A = \tan^{-1}\left(\frac{9}{15}\right) = 31.0^\circ$
- $m\angle A = \cos^{-1}\left(\frac{32}{45}\right) = 44.7^\circ$
- $m\angle A = \tan^{-1}\left(\frac{23}{28}\right) = 39.4^\circ$
- $m\angle A = \cos^{-1}\left(\frac{11}{16}\right) = 46.6^\circ$
- $m\angle A = \sin^{-1}\left(\frac{6}{10}\right) = 36.9^\circ$
- $m\angle A = \sin^{-1}(0.5684) = 34.6^\circ$
- $m\angle A = \cos^{-1}(0.1234) = 82.9^\circ$
- $m\angle A = \tan^{-1}(2.78) = 70.2^\circ$
- $m\angle A = \cos^{-1} 0.9845 = 10.1^\circ$
- $m\angle A = \tan^{-1} 15.93 = 86.4^\circ$
- $m\angle A = \sin^{-1} 0.7851 = 51.7^\circ$
- $m\angle A = 38^\circ, BC \approx 9.38, AC \approx 15.23$
- $m\angle A = 18.4^\circ, m\angle B = 71.6^\circ, AB \approx 12.6$
- $m\angle A \approx 45.6^\circ, m\angle C \approx 44.4^\circ, AB \approx 7.14$
- $m\angle A = 60^\circ, BC = 12, AC = 12\sqrt{3}$
- $m\angle A \approx 48.2^\circ, m\angle B \approx 41.8^\circ, CB \approx 15.7$
- $m\angle B = 50^\circ, AB \approx 49.8, AC \approx 38.1$
- $m\angle C = 75^\circ, BC \approx 19.3, AB \approx 18.6$
- $m\angle A = 58^\circ, AC \approx 29.7, BC \approx 47.5$
- $m\angle A \approx 36.7^\circ, m\angle B \approx 53.1^\circ, BC = 15$