

Answers for 7.7

For use with pages 485–492

7.7 Skill Practice

1. angles, sides
2. Use the Pythagorean Theorem if you have two sides of the triangle. Use a trigonometric ratio if you have an angle measure and a side length.
3. 33.7° 4. 24.4° 5. 74.1°
6. 27.0° 7. 53.1° 8. 54.3°
9. B
10. $m\angle K = 50^\circ$, $KL \approx 5.1$, $ML \approx 6.1$
11. $m\angle N = 25^\circ$, $NP \approx 21.4$,
 $NQ \approx 23.7$
12. $m\angle T = 33^\circ$, $RS \approx 9.7$, $RT \approx 17.9$
13. $m\angle A \approx 36.9^\circ$, $m\angle B \approx 53.1^\circ$,
 $AC \approx 15$
14. $m\angle D \approx 70.5^\circ$, $m\angle F \approx 19.5^\circ$,
 $EF \approx 8.5$
15. $m\angle G \approx 29^\circ$, $m\angle J \approx 61^\circ$,
 $HJ \approx 7.7$
16. $m\angle A = 46.4^\circ$, $AB \approx 7.2$,
 $AC \approx 5.0$
17. $m\angle D \approx 29.7^\circ$, $m\angle E \approx 60.3^\circ$,
 $ED \approx 5.4$
18. $m\angle H = 60.1^\circ$, $GJ \approx 9.4$,
 $JH \approx 5.4$
19. WX should have been used instead
of WY ; $\sin^{-1} \frac{7}{WX} = 36^\circ$.

20. To determine the measure of angle T using cosine, the ratio is adjacent over hypotenuse;

$$\cos^{-1} \frac{15}{17} = m\angle T.$$

21. 30° 22. 48.6° 23. 70.7°
24. 50.2° 25. 45° 26. 15.6°
27. 11.0° 28. 35.9° 29. B
30. \tan^{-1} is the function which is used to determine the measure of an angle given the proper ratio of sides.
31. 45° ; 60°
32. a. 0 to 10° b. 89°
c. 60° d. no
33. 6 cm, 2 cm, $2\sqrt{10}$ cm, 90° ,
about 18.4° , about 71.6°

7.7 Problem Solving

34. about 38.7°
35. about 59.7° ; $\tan^{-1} \frac{12}{7} \approx 59.7^\circ$
36. no
37. $\tan^{-1} \frac{BC}{AC}$; the information
needed to determine the measure of A is given. If you used the tangent ratio, this will make the answer more accurate since no rounding has occurred.

Answers for 7.7 continued

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38. a. about 1716 ft

b. about 2986 ft

c. About 1270 ft; subtract the two distances to find out how far the two hikers are from each other.

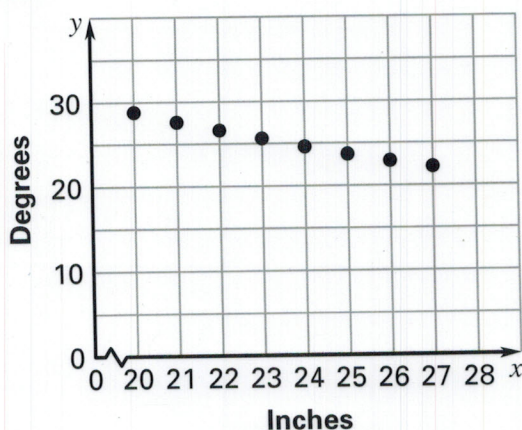
39. a.

x (inches)	20	21	22
y (degrees)	28.8	27.6	26.6

x (inches)	23	24	25
y (degrees)	25.6	24.6	23.7

x (inches)	26	27
y (degrees)	22.9	22.2

b.



c. *Sample answer:* The longer the rack, the closer to 20° the angle gets.

40. *Sample answer:* You want to know how tall your town's water tower is. You are standing 40 feet away from the base of the tower and the angle of elevation is 60° . How tall is the water tower?

41. a. 38.4 ft

b. about 71.2 ft

c. about 48.7 ft

d. about 57.4° , about 38.0° ; neither; the sides are not the same, so the triangles are not congruent, and the angles are not the same, so the triangles are not similar.

e. Tangent was used because the height and the distance along the ground form a tangent relationship for the angle of elevation.

Answers for 7.7 continued

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42. Statements (Reasons)

1. $\triangle ABC$ with altitude \overline{CD}
(Given)
2. $\sin A = \frac{CD}{b}$ and $\sin B = \frac{CD}{a}$
(Definition of sine)
3. $CD = b \sin A$ and
 $CD = a \sin B$
(Multiplication Property
of Equality)
4. $b \sin A = a \sin B$
(Substitution Property
of Equality)
5. $\frac{\sin A}{a} = \frac{\sin B}{b}$ (Division
Property of Equality)

7.7 Mixed Review

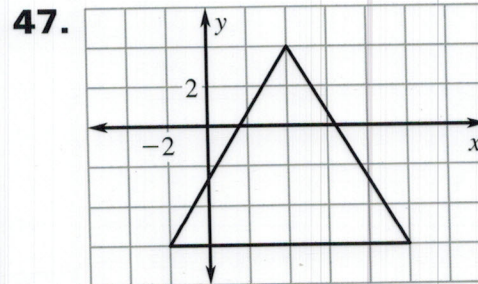
43.

Number of sides	Type of polygon
5	Pentagon
12	Dodecagon
8	Octagon
3	Triangle
7	Heptagon
n	n -gon
4	Quadrilateral
10	Decagon
9	Nonagon
6	Hexagon

44. (2, 3)

45. (4, 6)

46. (3, -4)



Answers for 7.7 *continued*

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7.5–7.7 Mixed Review of Problem Solving

1. **a.** about 13.0 m
b. about 17.8 m
c. about 4.8 m

- 2. a.**
-
- friend 10 m you
- 85°
- rock

- b.** Use the tangent ratio.
c. about 76.5 m

3. about 2.4 m; $\sin 34^\circ = \frac{1.35}{x}$

4. about 18.9 ft;

1	8	.	9

- 5. a.** $9\sqrt{3}$. *Sample answer:* Use the Pythagorean Theorem with $\triangle AEC$, since $\triangle ACD$ is isosceles, and \overline{AD} is bisected by E , \overline{EC} is the altitude and is therefore perpendicular to the base.
- b.** About 10.9° . *Sample answer:* Find the measure of $\angle ACE$ using the sine ratio, then find the measure of $\angle ACB$ because it is supplementary to $\angle ACE$ and then the law of cosines allows you to find the measure of $\angle ABC$.

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5. c. *Sample answer:* Part (a): Since the hypotenuse is 18 and the given leg is half of that, the triangle must be a 30° - 60° - 90° triangle and therefore, the other leg must be $9\sqrt{3}$; part (b): EB must equal $3x$ and since $x = 9\sqrt{3}$, $EB = 27\sqrt{3}$. Now you can use the inverse tangent function to determine the measure of $\angle ABC$.

6. about 8.6 ft; about 11.0 ft

7. 65° ;

		6	5
•	•	•	•
0	0	0	0
1	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

$$3) \sin 34^\circ = \frac{1.35}{x}$$

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1) $C = 66^\circ$
 $a = 4.4$
 $c = 8.3$

2) $A = 29^\circ$
 $b = 19.4$
 $c = 20.4$

3) $B = 81.8^\circ$
 $C = 47.2^\circ$
 $b = 22.9$

4) $B = 82.8^\circ$
 $C = 55.8^\circ$
 $A = 41.4^\circ$

5) $A = 58.1^\circ$
 $B = 85.6^\circ$
 $C = 36.2$

6) $A = 47.4^\circ$
 $C = 44.7^\circ$
 $b = 61.1$

7) about 10 blocks

