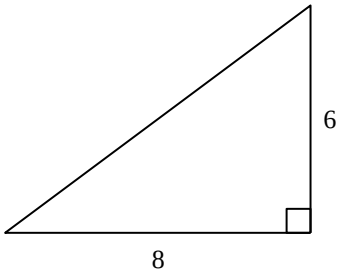
Geometry Unit 7 Practice Group Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

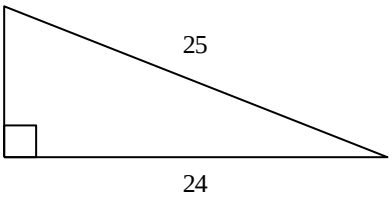
Find the length of the missing side. The triangle is not drawn to scale.

1.



a. 28 b. 100 c. 10 d. 48

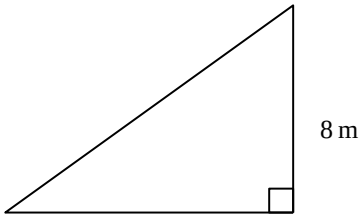
2.



a. 35 b. 49 c. 7 d. 2

Find the length of the missing side. Leave your answer in simplest radical form.

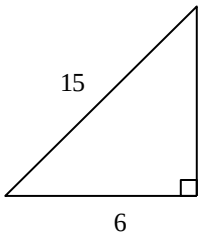
3.



Not drawn to scale

a. $\sqrt{17}$ m b. 113 m c. $\sqrt{113}$ m d. $\sqrt{71}$ m

4.



Not drawn to scale

a. $3\sqrt{29}$ cm b. $3\sqrt{21}$ cm c. $\sqrt{21}$ cm d. 3 cm

5. A triangle has sides of lengths 12, 14, and 19. Is it a right triangle? Explain.

a. yes; $12^2 + 14^2 \neq 19^2$

b. no; $12^2 + 14^2 = 19^2$

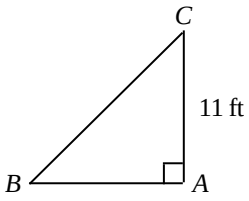
c. no; $12^2 + 14^2 \neq 19^2$

d. yes; $12^2 + 14^2 = 19^2$

6. A triangle has side lengths of 8 cm, 15 cm, and 16 cm. Classify it as acute, obtuse, or right.

a. obtuse b. right c. acute

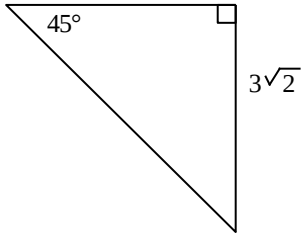
7. In triangle *ABC*, $\angle A$ is a right angle and $m\angle B = 45°$. Find *BC*. If you answer is not an integer, leave it in simplest radical form.



Not drawn to scale

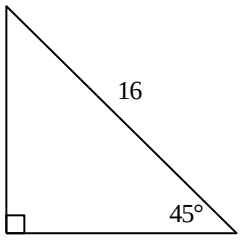
a. 22 ft b. $22\sqrt{2}$ ft c. 11 ft d. $11\sqrt{2}$ ft

8. Find the length of the hypotenuse.



a. 12 b. 6 c. 5 d. 18

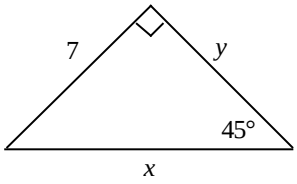
9. Find the length of the leg. If your answer is not an integer, leave it in simplest radical form.



Not drawn to scale

a. 128 b. $8\sqrt{2}$ c. 16 d. $2\sqrt{2}$

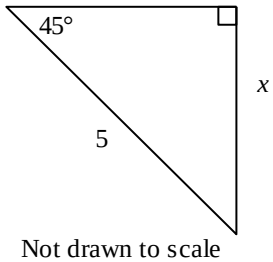
10. Find the lengths of the missing sides in the triangle. Write your answers as integers or as decimals rounded to the nearest tenth.



Not drawn to scale

a. $x = 7, y = 9.9$ b. $x = 9.9, y = 7$ c. $x = 4.9, y = 6.1$ d. $x = 6.1, y = 4.9$

11. Find the value of the variable. If your answer is not an integer, leave it in simplest radical form.



Not drawn to scale

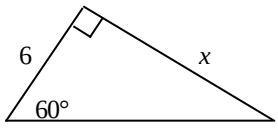
a. $5\sqrt{2}$ b. $\frac{5\sqrt{3}}{2}$ c. $\frac{5\sqrt{2}}{2}$ d. $5\sqrt{3}$

12. Find the length, *d*, in simplest radical form, of the diagonal of a cube with sides of *s* units.

a. $\sqrt{s}$ b. $s\sqrt{2}$ c. $s\sqrt{3}$ d. 3*s*

Find the value of the variable(s). If your answer is not an integer, leave it in simplest radical form.

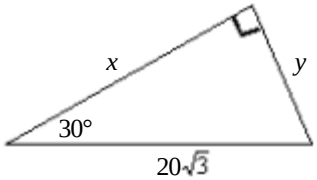
13.



Not drawn to scale

a. 2 b. $12\sqrt{3}$ c. $\frac{1}{2}$ d. $6\sqrt{3}$

14.

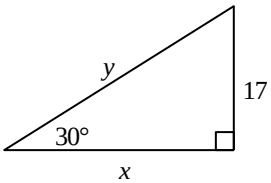


Not drawn to scale

a. $x = 10\sqrt{3}, y = 30$ c. $x = 30\sqrt{3}, y = 10$

b. $x = 10, y = 30\sqrt{3}$ d. $x = 30, y = 10\sqrt{3}$

15.

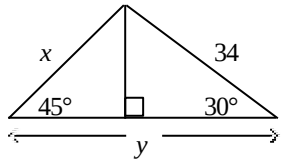


Not drawn to scale

a. $x = 17, y = 34\sqrt{3}$ c. $x = 34\sqrt{3}, y = 17$

b. $x = 34, y = 17\sqrt{3}$ d. $x = 17\sqrt{3}, y = 34$

16. Find the value of x and y rounded to the nearest tenth.

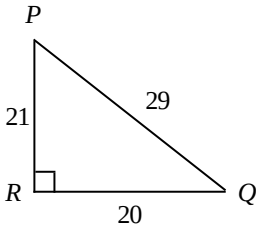


a. $x = 48.1, y = 46.4$
b. $x = 48.1, y = 139.3$
c. $x = 24.0, y = 139.3$
d. $x = 24.0, y = 46.4$

17. The length of the hypotenuse of a 30°-60°-90° triangle is 4. Find the perimeter.

a. $4 + 12\sqrt{3}$
b. $6 + 2\sqrt{3}$
c. $2 + 6\sqrt{3}$
d. $12 + 4\sqrt{3}$

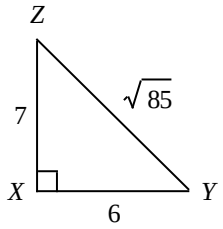
18. Write the tangent ratios for $\angle P$ and $\angle Q$.



Not drawn to scale

a. $\tan P = \frac{29}{21}; \tan Q = \frac{21}{29}$
b. $\tan P = \frac{20}{21}; \tan Q = \frac{21}{20}$
c. $\tan P = \frac{21}{20}; \tan Q = \frac{20}{21}$
d. $\tan P = \frac{29}{20}; \tan Q = \frac{20}{29}$

19. Write the tangent ratios for $\angle Y$ and $\angle Z$.

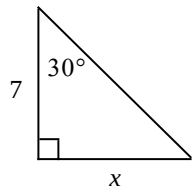


Not drawn to scale

a. $\tan Y = \frac{6}{7}; \tan Z = \frac{7}{6}$
b. $\tan Y = \frac{\sqrt{85}}{7}; \tan Z = \frac{\sqrt{85}}{6}$
c. $\tan Y = \frac{7}{6}; \tan Z = \frac{6}{7}$
d. $\tan Y = \frac{7}{\sqrt{85}}; \tan Z = \frac{6}{\sqrt{85}}$

Find the value of *x*. Round your answer to the nearest tenth.

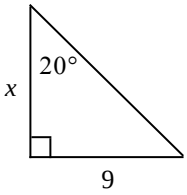
20.



Not drawn to scale

a. 3.5 b. 12.1 c. 6.1 d. 4

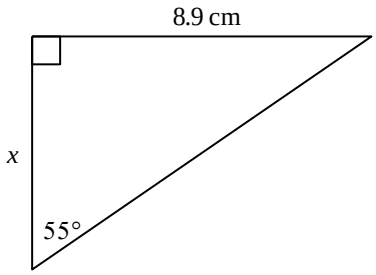
21.



Not drawn to scale

a. 3.3 b. 3.1 c. 24.7 d. 8.5

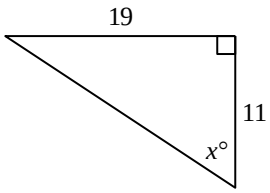
22.



a. 6.2 cm b. 12.7 cm c. 15.5 cm d. 10.9 cm

Find the value of *x* to the nearest degree.

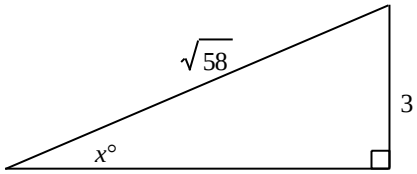
23.



Not drawn to scale

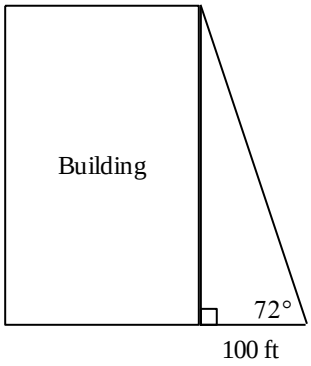
a. 30 b. 60 c. 70 d. 85

24.



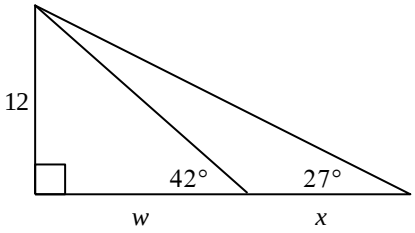
a. 67 b. 23 c. 83 d. 53

25. The students in Mr. Collin's class used a surveyor's measuring device to find the angle from their location to the top of a building. They also measured their distance from the bottom of the building. The diagram shows the angle measure and the distance. To the nearest foot, find the height of the building.



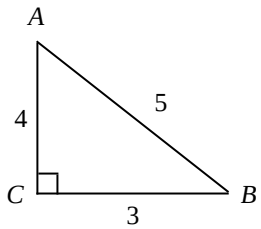
a. 2400 ft b. 72 ft c. 308 ft d. 33 ft

26. Find the value of *w*, then *x*. Round lengths of segments to the nearest tenth.



a. $w = 13.3$, $x = 10.2$
b. $w = 10.8$, $x = 6.1$
c. $w = 13.3$, $x = 23.6$
d. $w = 10.8$, $x = 16.9$

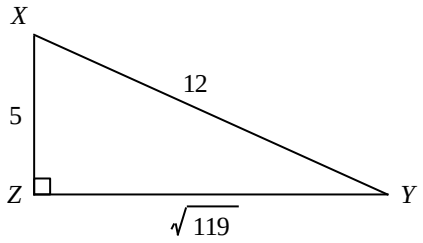
27. Write the ratios for sin *A* and cos *A*.



Not drawn to scale

a. $\sin A = \frac{3}{5}, \cos A = \frac{4}{5}$
b. $\sin A = \frac{4}{5}, \cos A = \frac{3}{5}$
c. $\sin A = \frac{3}{4}, \cos A = \frac{4}{5}$
d. $\sin A = \frac{3}{5}, \cos A = \frac{4}{3}$

28. Write the ratios for sin X and cos X.



a. $\sin X = \frac{\sqrt{119}}{5}, \cos X = \frac{5}{\sqrt{119}}$

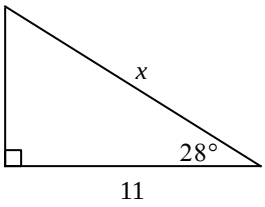
b. $\sin X = \sqrt{119}, \cos X = 5$

c. $\sin X = \frac{\sqrt{119}}{12}, \cos X = \frac{5}{12}$

d. $\sin X = \frac{5}{\sqrt{119}}, \cos X = \frac{\sqrt{119}}{5}$

Find the value of *x*. Round to the nearest tenth.

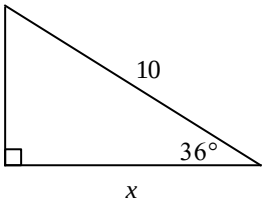
29.



Not drawn to scale

a. 12.5 b. 10 c. 13 d. 9.7

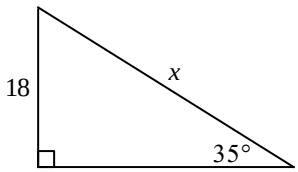
30.



Not drawn to scale

a. 12.9 b. 8.5 c. 12.4 d. 8.1

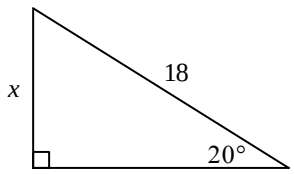
31.



Not drawn to scale

a. 10.3 b. 31.4 c. 10.7 d. 31.8

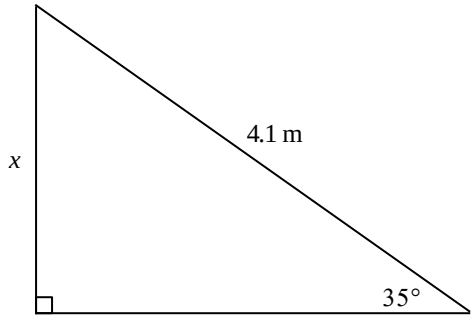
32.



Not drawn to scale

a. 52.6 b. 52.9 c. 6.2 d. 6.5

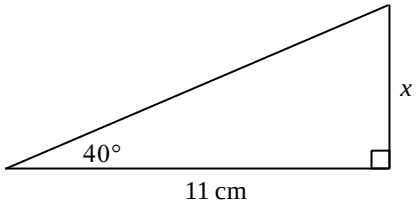
33. A slide 4.1 meters long makes an angle of 35° with the ground. To the nearest tenth of a meter, how far above the ground is the top of the slide?



a. 7.1 m b. 3.4 m c. 5.0 m d. 2.4 m

Find the value of *x*. Round the length to the nearest tenth.

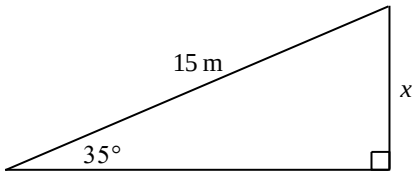
34.



Not drawn to scale

a. 7.1 cm b. 13.1 cm c. 9.2 cm d. 8.4 cm

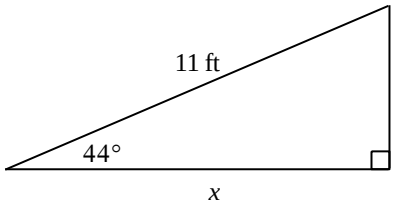
35.



Not drawn to scale

a. 26.2 m b. 10.5 m c. 8.6 m d. 12.3 m

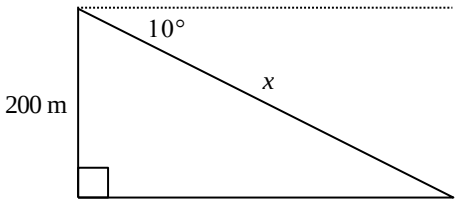
36.



Not drawn to scale

a. 7.6 ft b. 10.6 ft c. 15.3 ft d. 7.9 ft

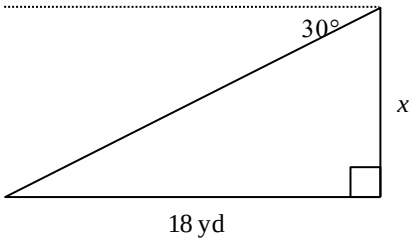
37.



Not drawn to scale

a. 1134.3 m b. 1151.8 m c. 34.7 m d. 203.1 m

38.



Not drawn to scale

a. 15.6 yd b. 10.4 yd c. 9 yd d. 31.2 yd

Essay

39. A 16-foot ladder is placed against the side of a building as shown in Figure 1 below. The bottom of the ladder is 8 feet from the base of the building. In order to increase the reach of the ladder against the building, the ladder is moved 4 feet closer to the base of the building as shown in Figure 2.

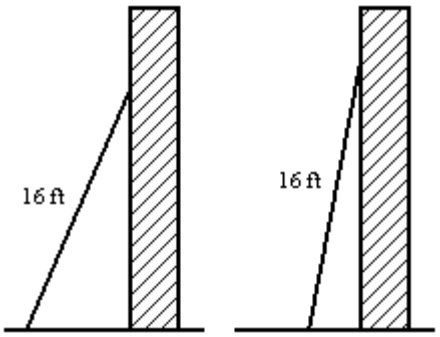


Figure 1

Figure 2

To the *nearest foot*, how much farther up the building does the ladder now reach? Show how you arrived at your answer.

40. A garden space is a triangle with angle measures of 45°, 45°, and 90°. One leg of the triangle measures 15 feet.
    a. Find the length of the longest side of the garden. Then sketch and label the garden space. Explain how you find the length.
    b. Find the exact value of the sine and cosine of a 45°-angle.
    c. Show that $(\sin 45^\circ)^2 + (\cos 45^\circ)^2 = 1$. Show your steps.

Other

41. A triangle has sides that measure 33 cm, 65 cm, and 56 cm. Is it a right triangle? Explain.

Geometry Unit 7 Practice Group Test
Answer Section

MULTIPLE CHOICE

1. C
2. C
3. C
4. B
5. C
6. C
7. D
8. B
9. B
10. B
11. C
12. C
13. D
14. D
15. D
16. D
17. B
18. B
19. C
20. D
21. C
22. A
23. B
24. B
25. C
26. A
27. A
28. C
29. A
30. D
31. B
32. C
33. D
34. C
35. C
36. D
37. B
38. B

ESSAY

39.

[4] Answers may vary. Sample:
The height of the ladder by the first building is

$$8^2 + h^2 = 16^2$$

$$h^2 = 192$$

$$h = \sqrt{192}$$

The height of the ladder by the second building is

$$4^2 + h^2 = 16^2$$

$$h^2 = 240$$

$$h = \sqrt{240}$$

$$\sqrt{240} - \sqrt{192} \approx 2$$

The second ladder goes about 2 feet higher than the first ladder.

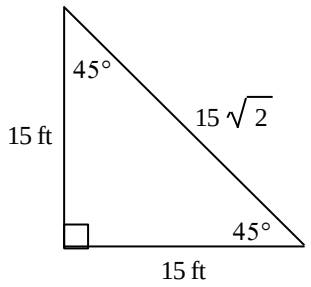
[3] correct methods, but error in computation

[2] error in method used

[1] correct answer but work not shown

40.

[4] **a.**



To find the length of the longest side, recall the relationship between the length of a leg of a 45°-45°-90° triangle and the hypotenuse. The length of the hypotenuse, the longest side, is equal to the leg length times $\sqrt{2}$, or $15\sqrt{2}$.

b. $\sin 45° = \frac{15}{15\sqrt{2}} = \frac{\sqrt{2}}{2}$ and $\cos 45° = \frac{15}{15\sqrt{2}} = \frac{\sqrt{2}}{2}$.

c.

$$(\sin 45°)^2 + (\cos 45°)^2 = \left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^2$$

$$= \frac{2}{4} + \frac{2}{4}$$

$$= \frac{4}{4}$$

$$= 1$$

[3] one mathematical error or correct answers with incomplete explanations

[2] two mathematical errors or correct answers with errors in explanation

[1] correct answers with no explanation

OTHER

41. Answers may vary. Sample:
$33^2 + 56^2 \stackrel{?}{} 65^2$

$1089 + 3136 \stackrel{?}{} 4225$

$4225 = 4225$

It is a right triangle because the sum of the squares of the shorter two sides equals the square of the longest side.