Name _____ Date _____

LESSON 5.5

Practice B

For use with pages 342–348

Use a ruler and protractor to draw the given type of triangle. Mark the largest angle and longest side in red and the smallest angle and shortest side in blue. What do you notice?

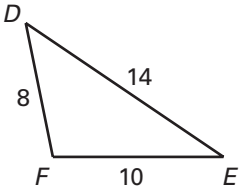
1. Obtuse scalene

2. Acute isosceles

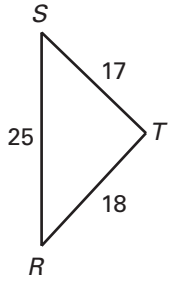
3. Right isosceles

List the sides and the angles in order from smallest to largest.

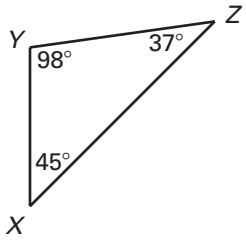
4.



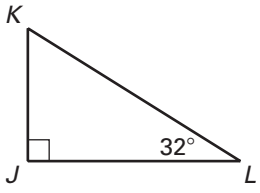
5.



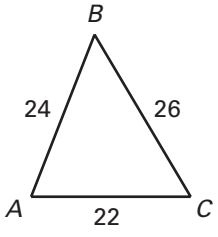
6.



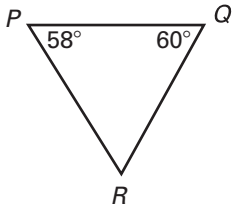
7.



8.



9.



Sketch and label the triangle described.

10. Side lengths: 14, 17, and 19, with longest side on the bottom
Angle measures: 45°, 60°, and 75°, with smallest angle at the right

11. Side lengths: 11, 18, and 24, with shortest side on the bottom
Angle measures: 25°, 44°, and 111°, with largest angle at the left

12. Side lengths: 32, 34, and 48, with shortest side arranged vertically at the right.
Angle measures: 42°, 45°, and 93°, with largest angle at the top.

Is it possible to construct a triangle with the given side lengths? If not, *explain* why not.

13. 3, 4, 5

14. 1, 4, 6

15. 17, 17, 33

16. 22, 26, 65

17. 6, 43, 39

18. 7, 54, 45

Name _____ Date _____

LESSON 5.5

Practice B *continued*

For use with pages 342–348

Describe **the possible lengths of the third side of the triangle given the lengths of the other two sides.**

19. 6 in., 9 in.

20. 4 ft, 12 ft

21. 9 m, 18 m

22. 21 yd, 16 yd

23. 22 in., 2 ft

24. 24 in., 1 yd

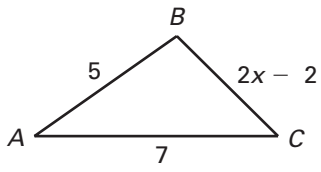
Is it possible to build a triangle using the given side lengths? If so, order the angle measures of the triangle from least to greatest.

25. $RS = \sqrt{46}, ST = 3\sqrt{5}, RT = 5$

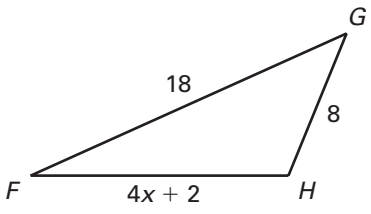
26. $AB = \sqrt{26}, BC = 4\sqrt{5}, AC = 2\sqrt{2}$

Describe **the possible values of *x*.**

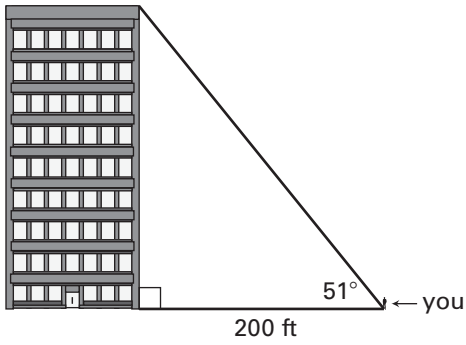
27.



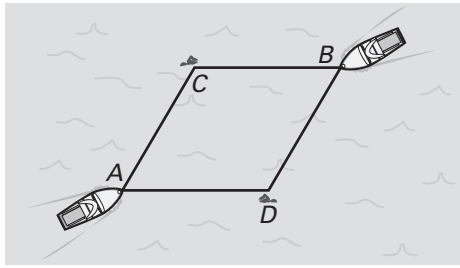
28.



29. **Building** You are standing 200 feet from a tall building. The angle of elevation from your feet to the top of the building is 51° (as shown in the figure). What can you say about the height of the building?



30. **Sea Rescue** The figure shows the relative positions of two rescue boats and two people in the water. Talking by radio, the captains use certain angle relationships to conclude that boat *A* is the closest to person *C* and boat *B* is the closest to person *D*. *Describe* the angle relationships that would lead to this conclusion.



31. **Airplanes** Two airplanes leave the same airport heading in different directions. After 2 hours, one airplane has traveled 710 miles and the other has traveled 640 miles. *Describe* the range of distances that represents how far apart the two airplanes can be at this time.

32. **Baseball** A pitcher throws a baseball 60 feet from the pitcher's mound to home plate. A batter pops the ball up and it comes down just 24 feet from home plate. What can you determine about how far the ball lands from pitcher's mound? Explain why the Triangle Inequality Theorem can be used to describe all but the shortest and longest possible distances.

Lesson 5.4, continued

10. Equation for m_1: $y = \frac{c}{b - 2a}(x - a)$;

equation for m_2: $y = \frac{c}{a + b}x$;

equation for m_3: $y = \frac{2c}{2b - a}\left(x - \frac{a}{2}\right)$

11. $\left(\frac{a + b}{3}, \frac{c}{3}\right)$ **12.** $\left(\frac{a + b}{3}, \frac{c}{3}\right)$ **13.** $\left(\frac{a + b}{3}, \frac{c}{3}\right)$

14. Yes, because each pair of lines all intersect at the same point.

Lesson 5.5

Practice Level A

1. smallest, $\angle C$; largest, $\angle B$ **2.** smallest, $\angle R$; largest, $\angle Q$ **3.** smallest, $\angle H$; largest, $\angle F$

4. smallest, $\angle N$; largest, $\angle M$ **5.** shortest, $\overline{RT}$; longest, $\overline{ST}$ **6.** shortest, $\overline{KJ}$; longest, $\overline{HJ}$

7. shortest, $\overline{AC}$; longest, $\overline{AB}$ **8.** shortest, $\overline{DF}$; longest, $\overline{DE}$ **9–10.** Check student's drawings. Longest side and largest angle are opposite each other, shortest side and smallest angle are opposite each other. **11.** smallest, $\angle D$; largest, $\angle F$ **12.** shortest, $\overline{EF}$; longest, $\overline{DE}$

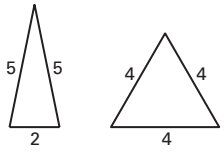
13. yes; $6 + 10 > 15$, $6 + 15 > 10$, and $10 + 15 > 6$ **14.** no; $16 + 11 < 32$

15. 6 in. $< x <$ 18 in. **16.** 5 ft $< x <$ 11 ft

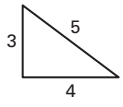
17. 5 cm $< x <$ 29 cm

18. 6 yd $< x <$ 20 yd **19.** $1 < x < 9$

20. *Sample answers:*



21. *Sample answer:*



22. *Sample answer:* 3, 3, 6; 2, 2, 8

23. The distance between Union Falls and Hardnedville must be less than 100 miles due to the Triangle Inequality Theorem.

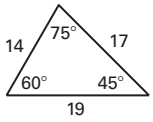
Practice Level B

1–3. Check student's drawings. Longest side and largest angle are opposite each other, shortest side and smallest angle are opposite each other.

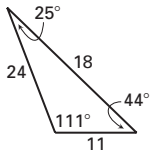
4. $\overline{DF}$, $\overline{FE}$, $\overline{DE}$; $\angle E$, $\angle D$, $\angle F$ **5.** $\overline{ST}$, $\overline{RT}$, $\overline{RS}$; $\angle R$, $\angle S$, $\angle T$ **6.** $\overline{XY}$, $\overline{YZ}$, $\overline{XZ}$; $\angle Z$, $\angle X$, $\angle Y$

7. $\overline{JK}$, $\overline{JL}$, $\overline{KL}$; $\angle L$, $\angle K$, $\angle J$ **8.** $\overline{AC}$, $\overline{AB}$, $\overline{BC}$; $\angle B$, $\angle C$, $\angle A$ **9.** $\overline{QR}$, $\overline{PR}$, $\overline{PQ}$; $\angle P$, $\angle Q$, $\angle R$

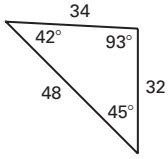
10.



11.



12.



13. yes **14.** No; $1 + 4 < 6$.

15. yes **16.** No; $22 + 26 < 65$.

17. yes **18.** No; $7 + 45 < 54$.

19. 3 in. $< x <$ 15 in. **20.** 8 ft $< x <$ 16 ft

21. 9 m $< x <$ 27 m **22.** 5 yd $< x <$ 37 yd

23. 2 in. $< x <$ 46 in. **24.** 12 in. $< x <$ 60 in.

25. yes; $\angle S$, $\angle R$, $\angle T$ **26.** no **27.** $2 < x < 7$

28. $2 < x < 6$ **29.** The building is taller than 200 ft. **30.** $m\angle C < m\angle D$

31. 70 mi $< d <$ 1350 mi

32. Think of the 60- and 24-ft distances as two sides of a triangle. Then the unknown distance d is 36 ft $< d <$ 84 ft. This doesn't account for the cases when the ball lands straight forward ($d = 36$ ft) or straight backward ($d = 84$ ft).

Practice Level C

1. smallest, $\angle A$ and $\angle B$; largest, $\angle C$

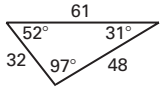
2. smallest, $\angle R$; largest, $\angle P$ **3.** smallest, $\angle H$; largest, $\angle G$ **4.** shortest, $\overline{RS}$; longest, $\overline{ST}$

5. shortest, $\overline{KH}$ and $\overline{KJ}$; longest, $\overline{JH}$

6. shortest, $\overline{AC}$; longest, $\overline{CB}$ **7.** $x > 4$ **8.** $x > \frac{3}{2}$

9. $12 < x < 21$ **10.** $5 < x < 11.5$

11.



12. $\overline{CD}$, $\overline{BC}$, $\overline{BD}$, $\overline{AB}$, $\overline{AD}$

13. $\overline{DE}$, $\overline{AE}$, $\overline{AD}$, $\overline{AB}$, $\overline{BD}$, $\overline{BC}$, $\overline{CD}$

14. 0 ft $< x <$ 12 ft **15.** 4 in. $< x <$ 14 in.

16. 5 yd $< x <$ 17 yd **17.** 60 in. $< x <$ 108 in.

18. 600 feet **19.** It is shorter to cut across the park because the sum of the lengths of the two sidewalks is greater than the length of the diagonal across the park. **20.** $\overline{RT} \perp \overline{TS}$, so $\triangle RTS$ is a right triangle. The largest angle in a right triangle is the right angle, so $m\angle RTS > m\angle RST$, so $RS > RT$. (If one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.)