Written Exercises

Tell whether a triangle with sides of the given lengths is acute, right, or obtuse.

A

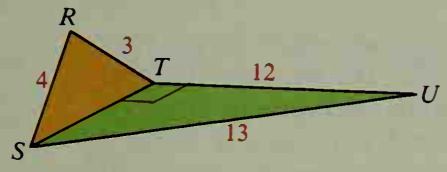
1. 11, 11, 15 **2.** 9, 9, 13 **3.** 8, $8\sqrt{3}$, 16

4. 6, 6, $6\sqrt{2}$ **5.** 8, 14, 17 **6.** 0.6, 0.8, 1

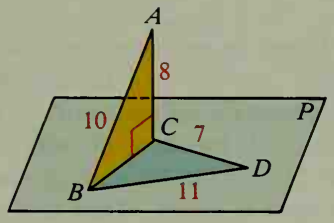
7. a. 0.5, 1.2, 1.3 **b.** $5n$, $12n$, $13n$ where $n > 0$

8. a. 33, 44, 55 **b.** $3n$, $4n$, $5n$ where $n > 0$

9. Given: $\angle UTS$ is a rt. $\angle$.
Show that $\triangle RST$ must be a rt. $\triangle$.



10. Given: $\overline{AC} \perp$ plane P
Show that $\triangle BCD$ must be obtuse.



Use the information to decide if $\triangle ABC$ is acute, right, or obtuse.

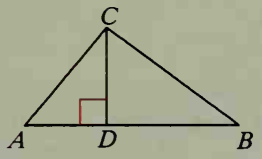
B

11. $AC = 13$, $BC = 15$, $CD = 12$

12. $AC = 10$, $BC = 17$, $CD = 8$

13. $AC = 13$, $BC = \sqrt{34}$, $CD = 3$

14. $AD = 2$, $DB = 8$, $CD = 4$



15. The sides of a triangle have lengths x, $x + 4$, and 20. Specify those values of x for which the triangle is acute with longest side 20.

16. Sketch $\square EFGH$ with $EF = 13$, $EG = 24$, and $FH = 10$. What special kind of parallelogram is $EFGH$? Explain.

17. Sketch $\square RSTU$, with diagonals intersecting at M. $RS = 9$, $ST = 20$, and $RM = 11$. Which segment is longer, $\overline{SM}$ or $\overline{RM}$? Explain.

18. If x and y are positive numbers with $x > y$, show that a triangle with sides of lengths $2xy$, $x^2 - y^2$, and $x^2 + y^2$ is always a right triangle.

19. a. Complete this statement of Theorem 8-5:
If the square of the longest side of a triangle $\underline{\quad ? \quad}$.

b. Prove Theorem 8-5.
Given: $\triangle RST$; $l^2 > j^2 + k^2$
Prove: $\triangle RST$ is an obtuse triangle.
(*Hint*: Start by drawing right $\triangle UVW$ with legs j and k. Compare lengths l and n.)