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**(A) Lesson Objectives**

- a. Know that the sum of the 3 interior angles in a triangle always sum to  $180^\circ$
- b. Define and work with the isosceles triangle theorem and the exterior angle theorem
- c. Incorporate the angle pair relationships (complementary, supplementary, vertically opposite, adjacent) to solving for angles in triangles
- d. Apply the solving of linear equations to the context of solving for angles in triangles

**(B) Explorations**

- a. Define the following terms/theorems related to triangles and include a diagram of each:

Terms Related to Triangles	Diagram
Triangle Sum Theorem	
Isosceles Triangles	
Isosceles Triangle Theorem	
Exterior Angle	
Exterior Angle Theorem	

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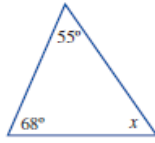
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b. Working With the Triangle Sum Theorem

Try these

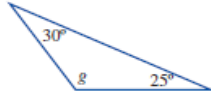
1 Find the value of the pronumeral in each of the following triangles.

a



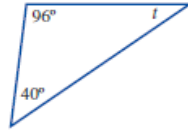
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b



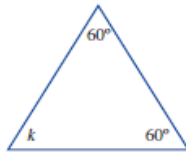
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c



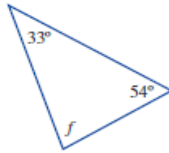
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d



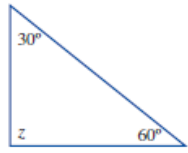
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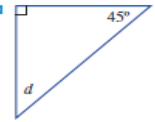
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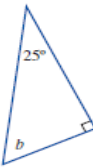
2 Find the value of the pronumeral in each of the following right-angled triangles.

a



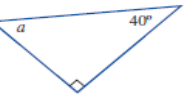
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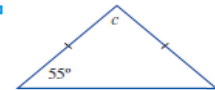
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3 Find the value of the pronumeral in each of the following triangles.

a



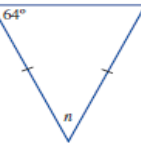
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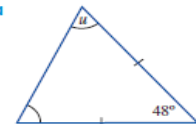
c



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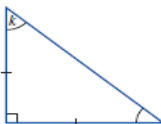
4 Find the value of the pronumeral in each of the following triangles.

a



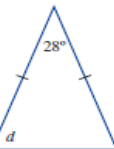
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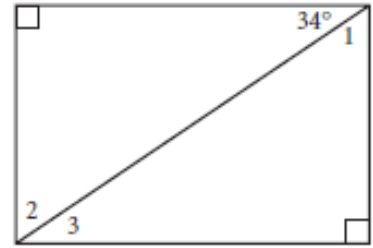
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**Lesson 3.5**

Use the rectangle at the right for Exercises 4–6.



4.  $m\angle 1$  \_\_\_\_\_

5.  $m\angle 2$  \_\_\_\_\_

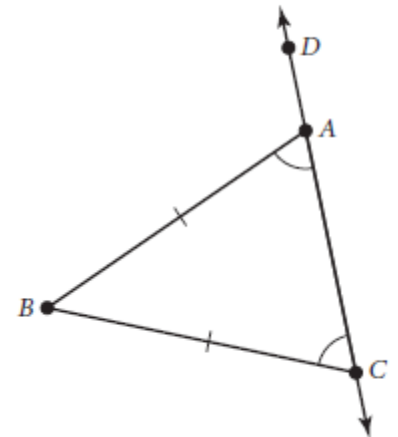
6.  $m\angle 3$  \_\_\_\_\_

In  $\triangle PQR$ ,  $m\angle P = (3x - 5)^\circ$ ,  $m\angle Q = (7x - 2)^\circ$ , and  $m\angle R = (5x + 7)^\circ$ . Find the indicated measures.

7.  $x$  \_\_\_\_\_ 8.  $m\angle P$  \_\_\_\_\_

9.  $m\angle Q$  \_\_\_\_\_ 10.  $m\angle R$  \_\_\_\_\_

In the figure at the right,  $\angle C \cong \angle BAC$ , and  $m\angle BAD = 113^\circ$ . Find the indicated measures.

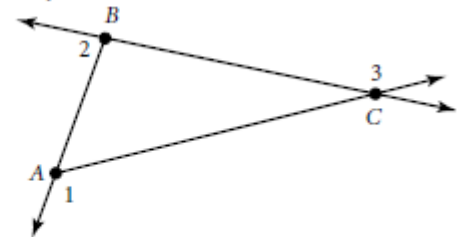


11.  $m\angle BAC$  \_\_\_\_\_

12.  $m\angle ACB$  \_\_\_\_\_

13.  $m\angle ABC$  \_\_\_\_\_

In  $\triangle ABC$  at the right,  $m\angle BAC = 4x + 6$ ,  $m\angle ABC = 6x + 24$ , and  $m\angle BCA = 4x - 25$ . Find the indicated measures.



14.  $m\angle 1$  \_\_\_\_\_

15.  $m\angle 2$  \_\_\_\_\_

16.  $m\angle 3$  \_\_\_\_\_

17. How many lines can be drawn parallel to  $\overline{CB}$  through  $A$ ? Why?

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