Name: _____ Date: _____

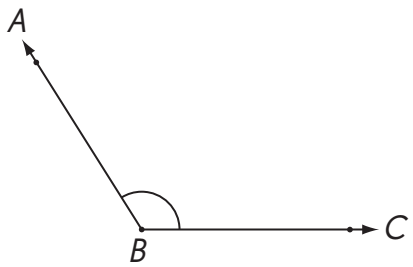
CHAPTER 9

Angles

Lesson 9.1 Understanding and Measuring Angles

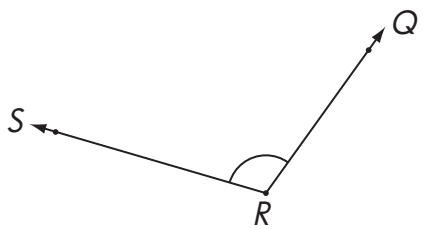
Name the angles in two ways.

1.

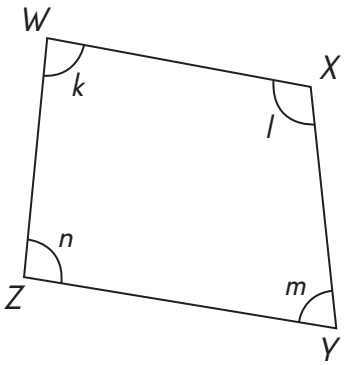


Angle at *B*: ∠ _____ or ∠ _____

2.



Angle at *R*: ∠ _____ or ∠ _____



3. ∠ *YZW*: ∠ _____ or ∠ _____

4. ∠ *WXY*: ∠ _____ or ∠ _____

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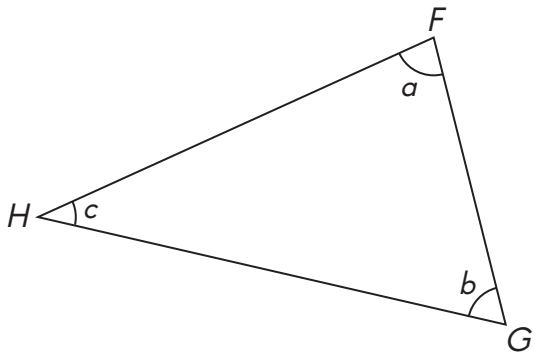
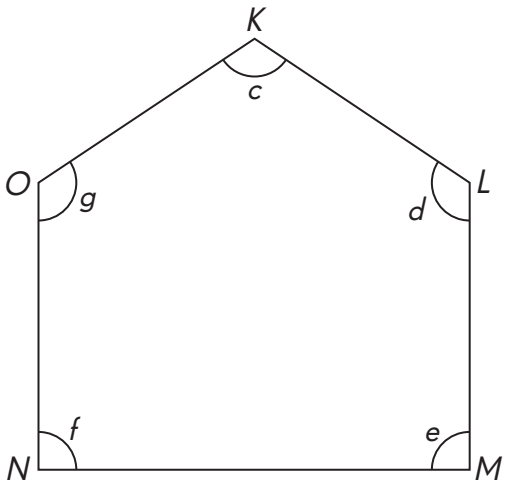
Name the angles in two ways.



5. ∠ *FGH*: ∠ _____ or ∠ _____

6. ∠ *GHF*: ∠ _____ or ∠ _____



7. ∠ *OKL*: ∠ _____ or ∠ _____

8. ∠ *NOK*: ∠ _____ or ∠ _____

9. ∠ *LMN*: ∠ _____ or ∠ _____

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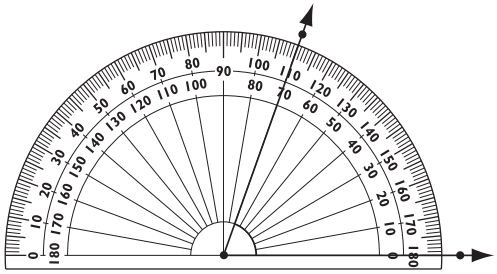
Decide which scale you would use to measure each angle. Fill in the blanks with *inner scale* or *outer scale*.

10.



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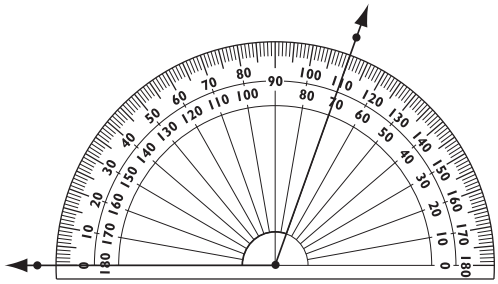
11.



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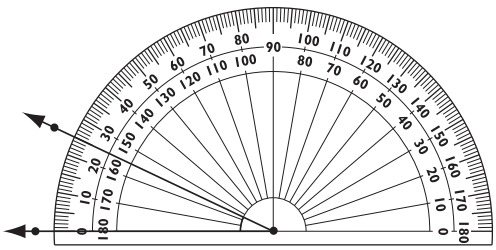
12.



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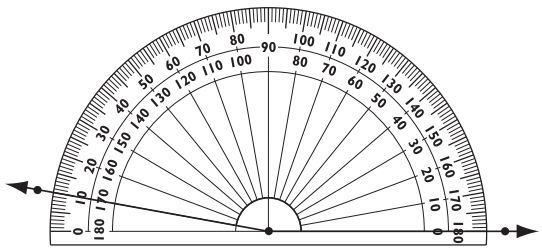
13.



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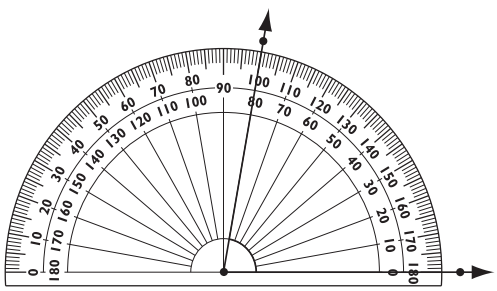
14.



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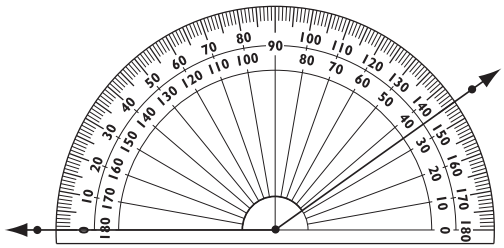
15.



_____

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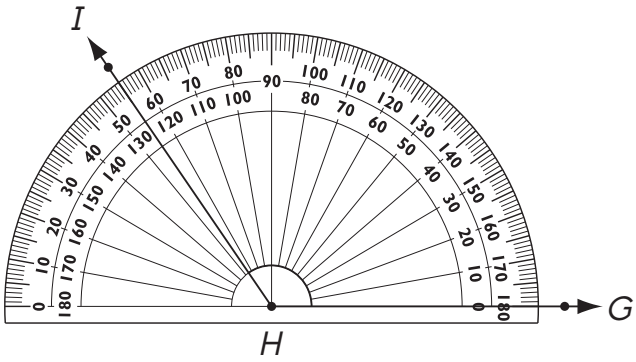
Write the measure of each angle in degrees. State whether it is an *acute angle* or an *obtuse angle*.

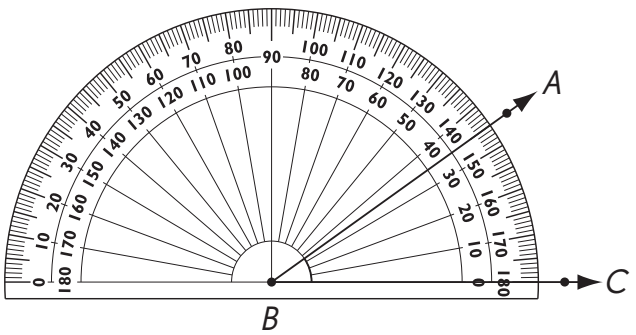
16.



Measure of $\angle GHI$ = _____

_____

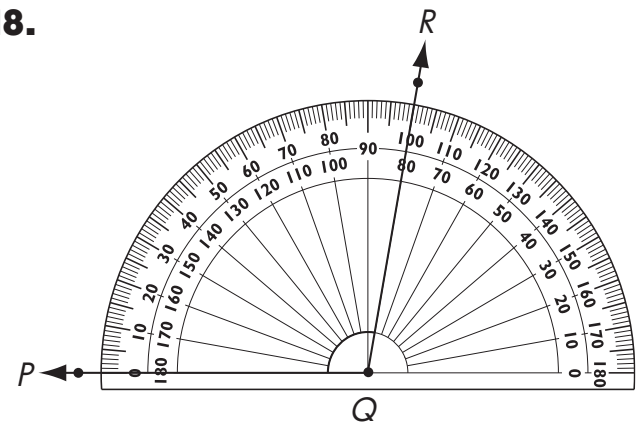
17.



Measure of $\angle ABC$ = _____

_____

18.



Measure of $\angle PQR$ = _____

_____

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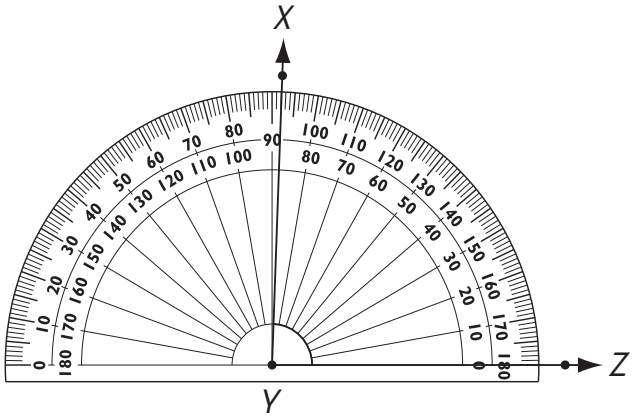
Write the measure of the angle in degrees. State whether it is an *acute angle* or an *obtuse angle*.

19.

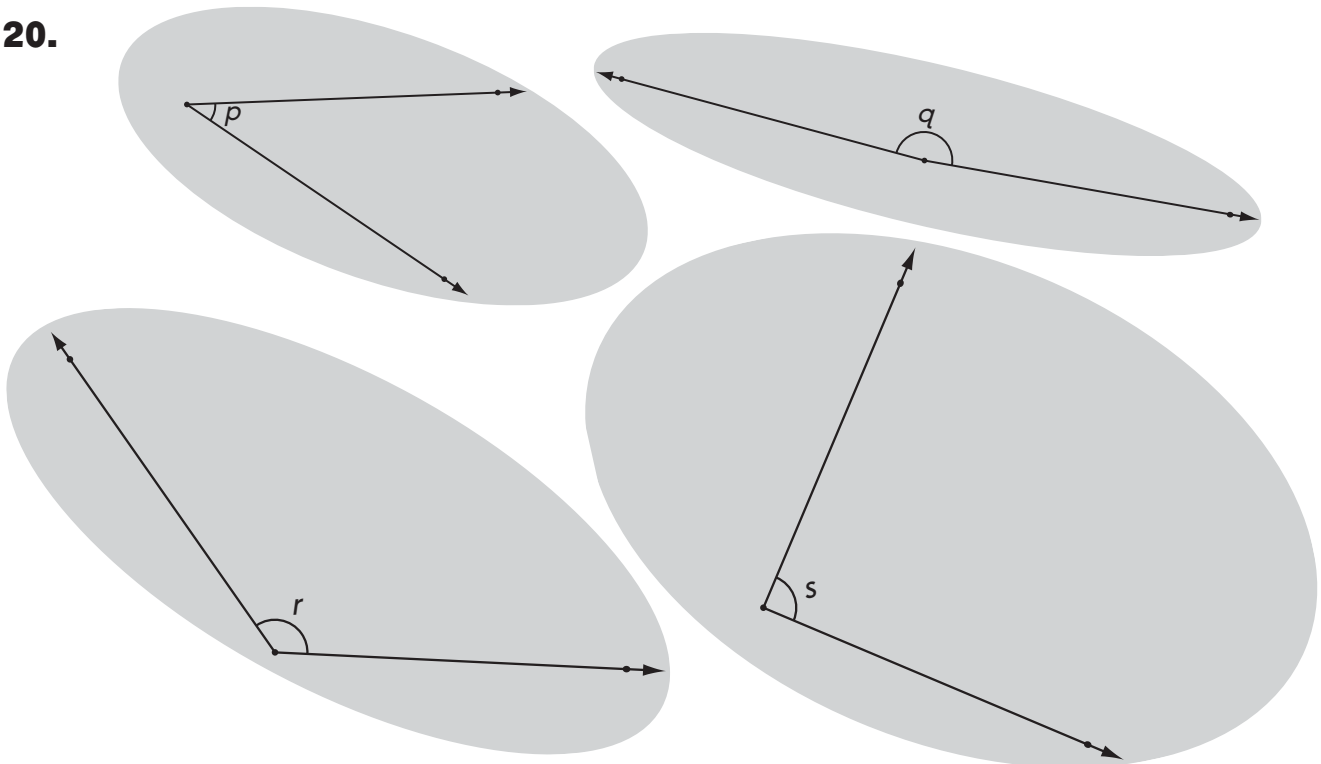


Measure of $\angle XYZ$ = _____

_____

Estimate and then measure each angle. Complete the table below.

20.



Angle	*p*	*q*	*r*	*s*
Estimate				
Measure				

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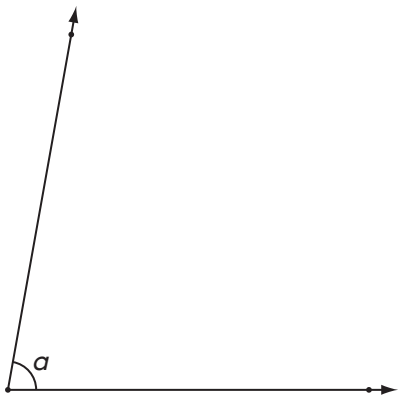
Name: _____ **Date:** _____

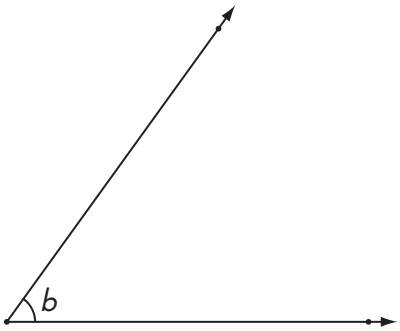
Measure the marked angles.

21.



_____

22.

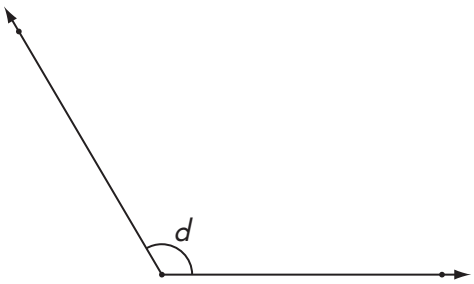


_____

23.

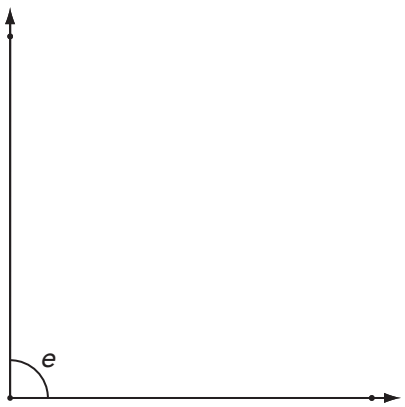
_____

24.



_____

25.



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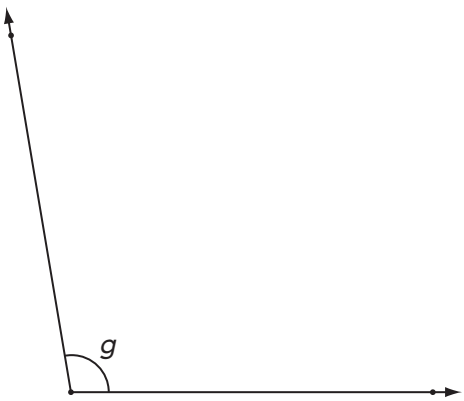
26.



_____

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Lesson 9.2 Drawing Angles to 180°

Use a protractor to draw each angle.

1. 57° using inner scale

2. 126° using outer scale

3. 64° using outer scale

4. 159° using inner scale

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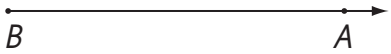
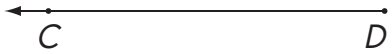
Draw a ray to form each angle.

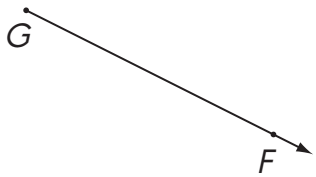
5. $\angle ABC = 28°$



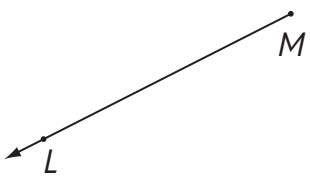
6. $\angle CDE = 89°$



7. $\angle FGH = 96°$

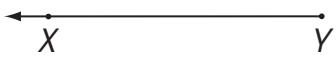


8. $\angle LMN = 102°$



9. $\angle PQR = 74°$

10. $\angle XYZ = 135°$



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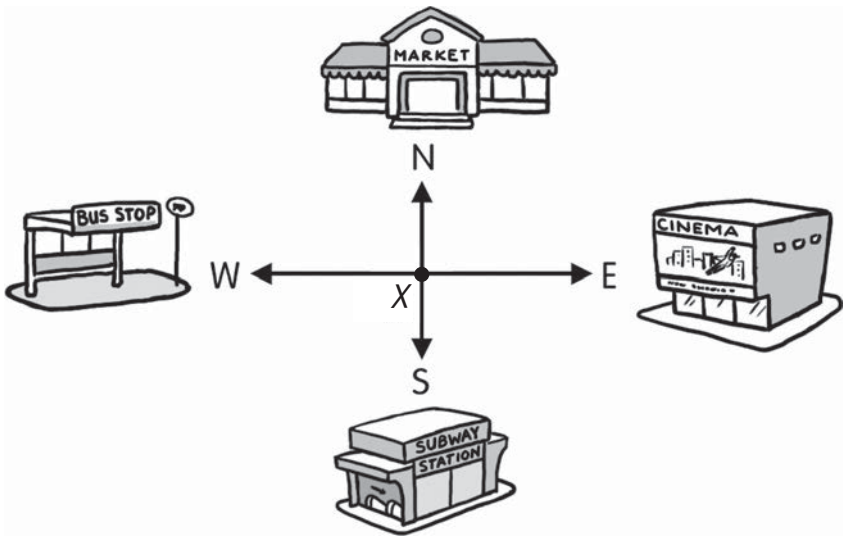
Lesson 9.3 Turns and Right Angles

Fill in the blanks.



1. You are at point *X* and you are facing the bus stop. You turn to the right until you face the market. What fraction of a turn do you make? _____

2. You are at point *X* and you are facing the cinema. You turn until you face the bus stop. What fraction of a turn do you make? _____

3. You are at point *X* and you are facing the subway station. You turn to the right until you face the cinema. What fraction of a turn do you make? _____

4. You are at point *X* and you are facing the market. You turn until you face the market again. What angle do you turn through? _____

5. You are at point *X* and you are facing the cinema. You turn to the right until you face the market. What angle do you turn through? _____

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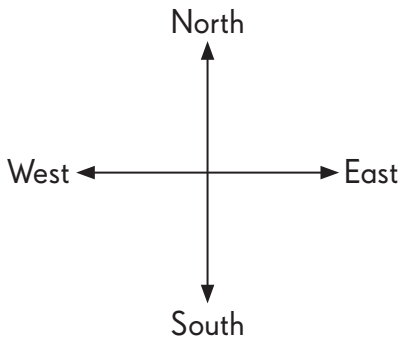
Use the diagram on the previous page to answer Exercises 6 and 7. Fill in the blanks.

6. You are at point *X* and you are facing the bus stop. You turn to the left until you face the subway station. What angle do you turn through? _____

7. You are at point *X* and you are facing the subway station. You turn until you face the market. What angle do you turn through? _____

Solve. Draw diagrams to show the directions.



8. Samantha is facing south. She makes a 90° turn to her right. Then she makes a $\frac{3}{4}$-turn to her left.

Samantha ends up facing _____.

9. Dino starts by facing west. He makes a $\frac{3}{4}$-turn to his right. Then he makes a 180° turn.

Dino ends up facing _____.

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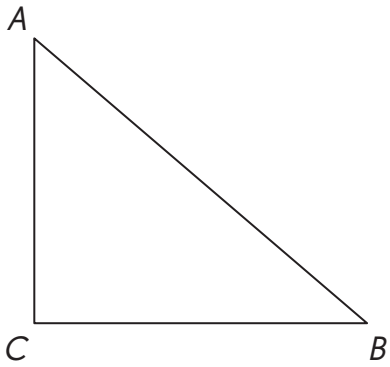
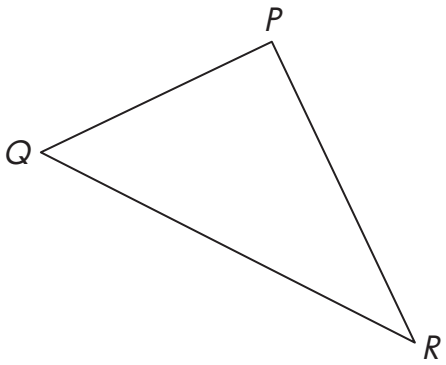
Identify and name the right angle in each of the following triangles.

10.



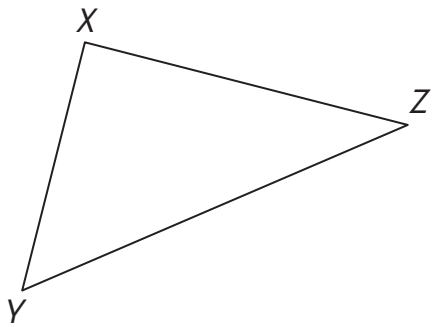
_____ = 90°

11.



_____ = 90°

12.



_____ = 90°

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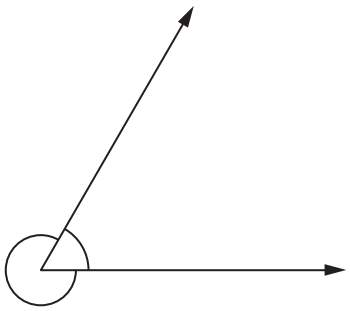
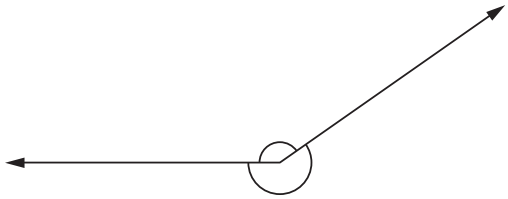
Measure the marked angles.

13.



_____

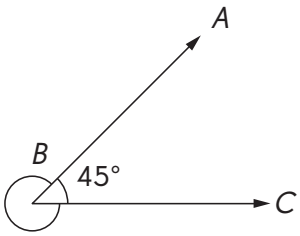
14.



_____

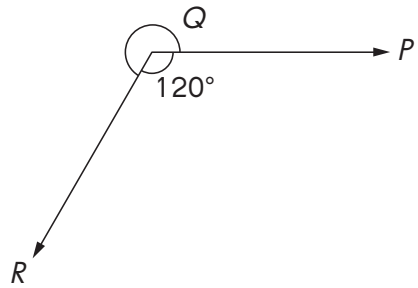
Find the marked angles.

15.



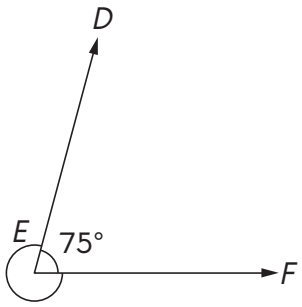
$\angle ABC =$

16.



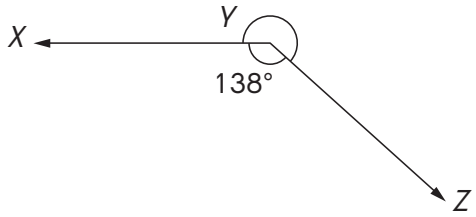
$\angle PQR =$

17.



$\angle DEF =$

18.



$\angle XYZ =$

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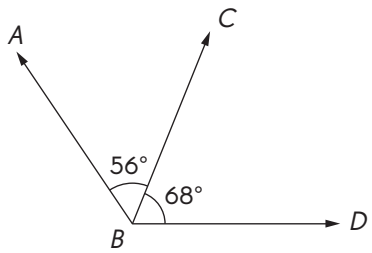
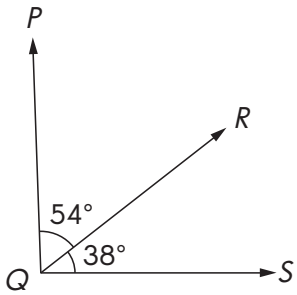
Look at the example. Then find the measure of each required angle.

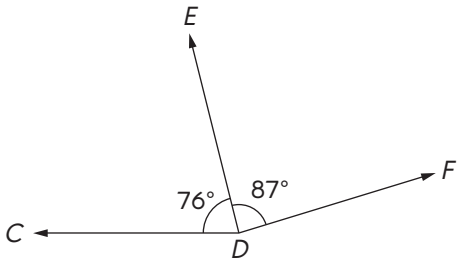
Example: $\angle ABD = \angle ABC + \angle CBD$
$= 56° + 68°$
$= 124°$



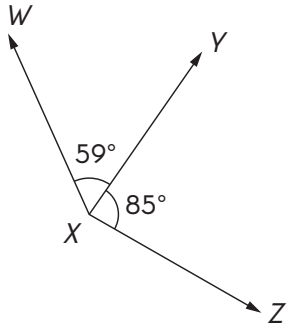
19. Find $\angle PQS$.



20. Find $\angle CDF$.



21. Find $\angle WXZ$.



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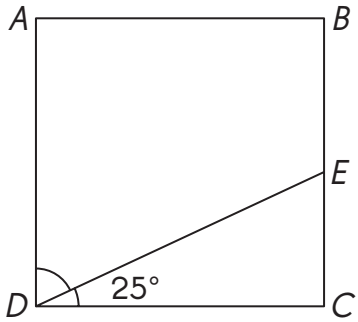
Put On Your Thinking Cap!

Find the measure of each marked angle.

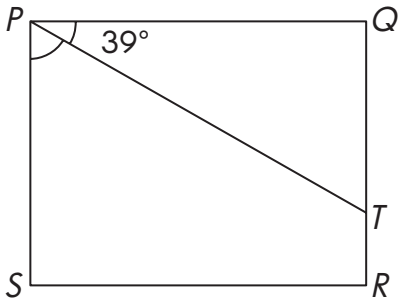
1.



ABCD is a square.
The measure of $\angle CDE = 25°$

The measure of $\angle ADE =$ _____

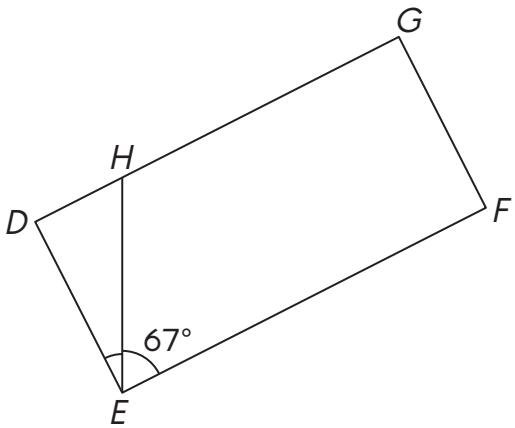
2.



PQRS is a rectangle.
The measure of $\angle QPT = 39°$

The measure of $\angle SPT =$ _____

3.



DEFG is a rectangle.
The measure of $\angle HEF = 67°$

The measure of $\angle DEH =$ _____

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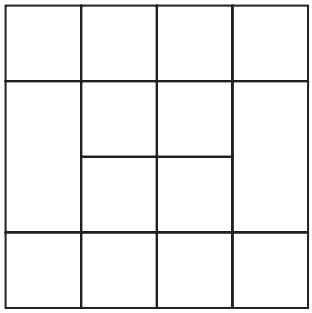
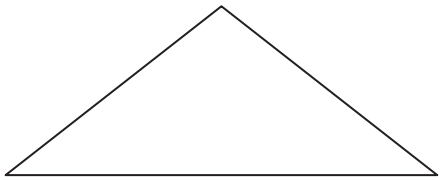
4. How many right angles can you find in this figure?



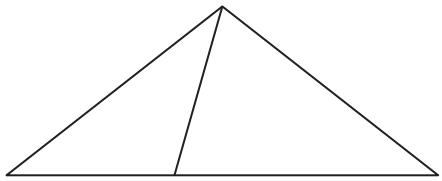
_____ right angles

Study the figures (a, b, c, d) and then complete the table.

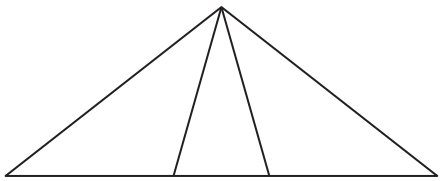
a.



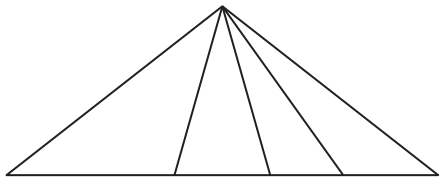
b.



c.



d.



5.

Figures	Number of Angles Smaller than a Right Angle	Number of Angles Larger than a Right Angle
a.		
b.		
c.		
d.		

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