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Angle Measure

4.MD.5.a, b; 4.MD.6; 4.MD.7

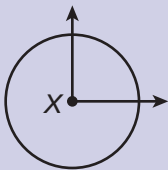


The measure of an angle is found in **degrees**. The symbol $^{\circ}$ means "degrees."
 90° means "90 degrees"

The \angle symbol means "angle." An m in front of the \angle means "the measure of an angle."

$m\angle Y$ means "measure of angle Y "

An angle is measured as part of a circle. If the vertex is at the center of the circle, the angle's measure is a fraction of the circle.

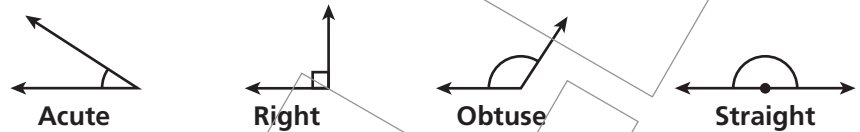


Angle X is a right angle. It measures 90° , or $\frac{1}{4}$ of the circle.

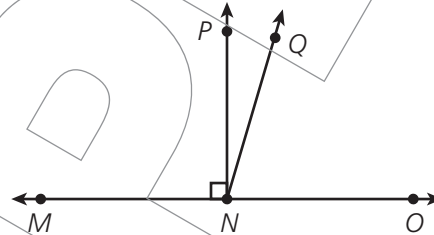
A circle measures 360° .

A protractor shows two sets of numbers. Be sure to read each set from the correct direction.

Angles can be classified by their measures.



What types of angles are in the figure below?



Angles ONQ and PNQ are **acute** angles. They are smaller than 90° .

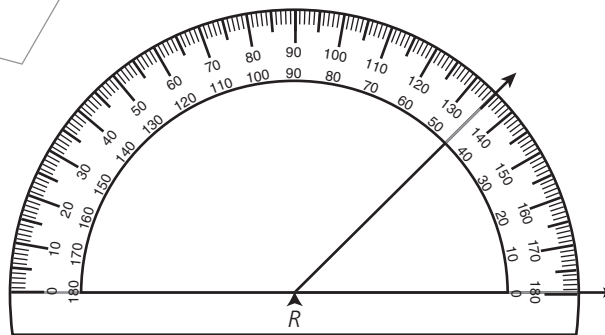
Angles PNM and PNO are **right** angles. They are exactly 90° .

Angle MNQ is an **obtuse** angle. It is greater than 90° but less than 180° .

Angle MNO is a **straight** angle. It is exactly 180° .

You measure an angle using a tool called a **protractor**.

What is the measure of $\angle R$?

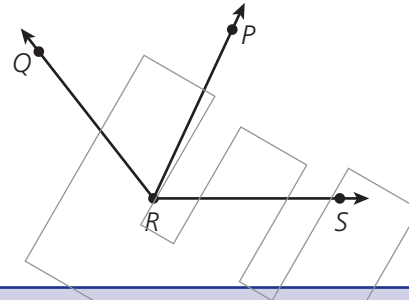


To measure an angle using a protractor, line up 0° with one ray of the angle. Find the point along the protractor where the angle's other ray lines up. Read the measure. Angle R measures 45° .

Read each problem. Circle the letter of the best answer.





SAMPLE Angle QRS has a measure of 128° and angle QRP has a measure of 63° . What is the measure of angle PRS ?

- A** 65° **C** 191°
B 128° **D** 193°

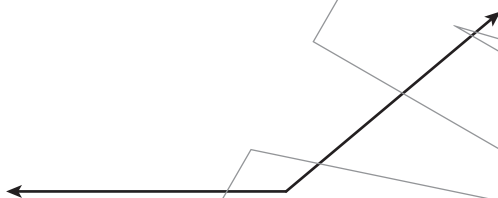


The correct answer is A. To find the measure of angle PRS , subtract the measure of angle QRP from the measure of angle QRS : $128^\circ - 63^\circ = 65^\circ$.

1 Maya's teacher asked her to draw a 25° angle. Which angle did Maya draw?

- A**  **C** 
B  **D** 

2 What is the measure of the angle below? Use your protractor.



- A** 40° **C** 130°
B 50° **D** 140°

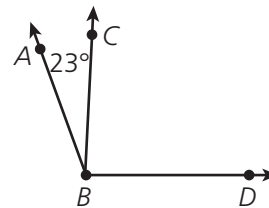
3 Yvette drew an angle that had a measure of 100° . What kind of angle did Yvette draw?

- A** acute **C** right
B obtuse **D** straight

4 Lon drew two angles. The measure of the first angle was 165° . The sum of the measures of the angles was 180° . What was the measure of the second angle?

- A** 15° **C** 90°
B 75° **D** 180°

5 In the figure below, $\angle ABD$ measures 110° .



Which number sentence could you use to find $m\angle CBD$?

- A** $m\angle CBD + 110^\circ = 23^\circ$
B $m\angle CBD - 23^\circ = 110^\circ$
C $m\angle CBD + 23^\circ = 110^\circ$
D $180^\circ - m\angle CBD = 23^\circ$

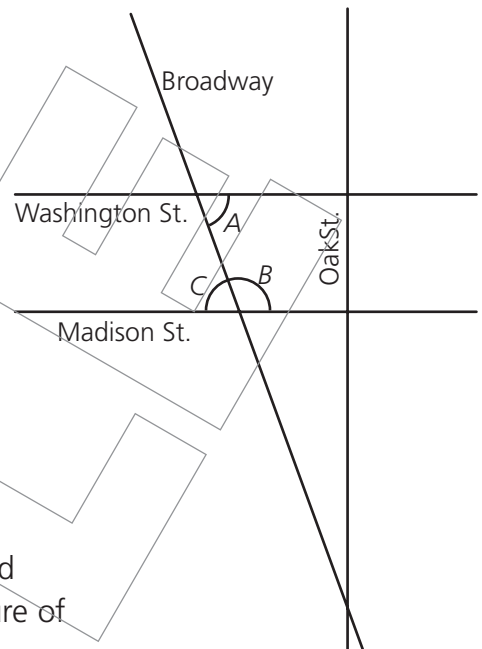
Read each problem. Write your answer.

SAMPLE The map shows a section of Turnersville. Use a protractor to find the measure of angle A at the corner of Broadway and Washington Street.

Answer _____



To find the measure of angle A , line up the 0 on the protractor with Broadway. Then find the mark on the protractor where Washington Street lines up. This is at 70° .



- 6 Orlando measures angle B at the corner of Madison Street and Broadway and finds that it is a 110° angle. What is the measure of angle C ? Explain how you found your answer.

- 7 Use your protractor to help you answer this question.

Angles MNO and PNO share ray NO . Angle MNO measures 35° . Angle PNO measures 40° . Draw these angles in the space at the right. What is the measure of angle MNP ?

Answer _____

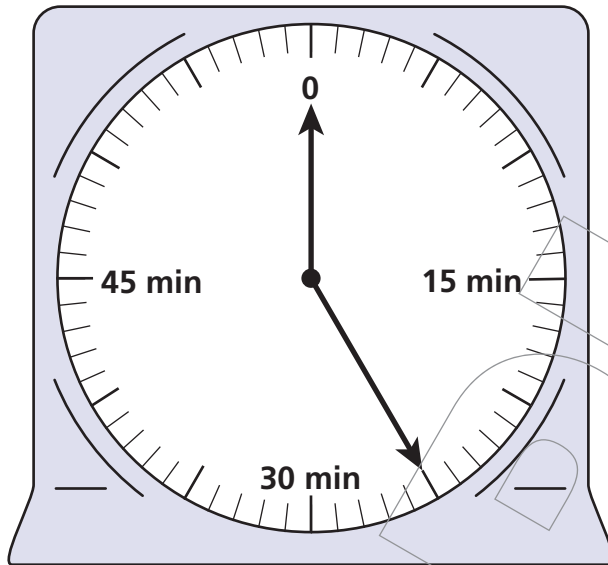
- 8 Use your protractor to help you answer this question.

Angle FGH measures 90° . In the space at the right, draw and label angle FGH . What kind of angle is angle FGH ?

Answer _____

Read the problem. Write your answer to each part.

9 Hana is baking bread. She is using a kitchen timer that has a circle for a dial. One hand of the timer points to 0. The other hand moves to mark the amount of time. She sets the dial for 25 minutes, as shown below.



Part A Use a protractor to find the measure of the angle the timer is set to.

Answer _____

Part B After 5 minutes, Hana checks on the bread. The hand that measures time has moved 30° closer to 0. What is the measure of the angle formed by the hand at 0 and the hand that tells how much time is left? Explain how you found your answer.



Imagine drawing another ray to show the angle of the timer after 5 minutes has passed. How is this angle related to the original angle?