

LESSON
1.4**Study Guide**

For use with pages 24–34

GOAL Name, measure, and classify angles.**Vocabulary**

An **angle** consists of two different rays with the same endpoint. The rays are the **sides** of the angle. The endpoint is the **vertex** of the angle.

An **acute** angle has measure greater than 0° and less than 90° .

A **right** angle has measure equal to 90° .

An **obtuse** angle has measure greater than 90° and less than 180° .

A **straight** angle has measure equal to 180° .

Two angles are **congruent angles** if they have the same measure.

An **angle bisector** is a ray that divides an angle into two angles that are congruent.

Postulate 3 Protractor Postulate: Consider \overleftrightarrow{OB} and a point A on one side of \overleftrightarrow{OB} . The rays of the form \overrightarrow{OA} can be matched one to one with the real numbers from 0 to 180. The **measure** of $\angle AOB$ is equal to the absolute value of the difference between the real numbers for \overrightarrow{OA} and \overleftrightarrow{OB} .

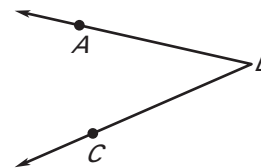
Postulate 4 Angle Addition Postulate: If P is in the interior of $\angle RST$, then $m\angle RST = m\angle RSP + m\angle PST$.

EXAMPLE 1 Name angles

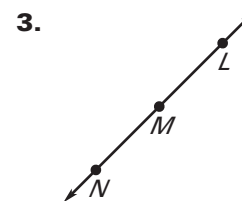
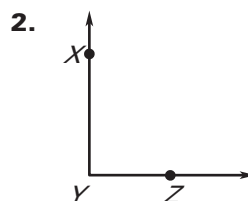
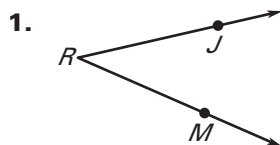
Write three names for the angle and name the vertex and sides of the angle.

Solution

Three names for the angle are $\angle ABC$, $\angle CBA$, or $\angle B$.
The vertex of the angle is point B . The sides of the angle are \overrightarrow{BA} and \overrightarrow{BC} .

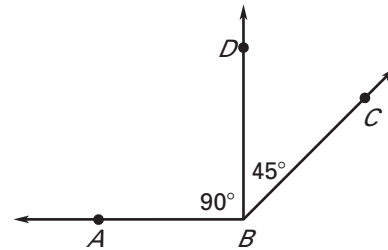
**Exercises for Example 1**

Write three names for the angle and name the vertex and sides of the angle.



LESSON
1.4**Study Guide** *continued*
For use with pages 24–34**EXAMPLE 2** Measure and classify angles

In the diagram, $m\angle ABD = 90^\circ$ and $m\angle DBC = 45^\circ$. Find $m\angle ABC$. Then classify each angle as *acute*, *right*, *obtuse*, or *straight*.

**Solution**

Use the Angle Addition Postulate to find $m\angle ABC$.

$$m\angle ABC = m\angle ABD + m\angle DBC \quad \text{Angle Addition Postulate}$$

$$m\angle ABC = 90^\circ + 45^\circ \quad \text{Substitute angle measures.}$$

$$m\angle ABC = 135^\circ \quad \text{Add.}$$

So, $m\angle ABC = 135^\circ$.

Because $m\angle ABD = 90^\circ$, $\angle ABD$ is a right angle.

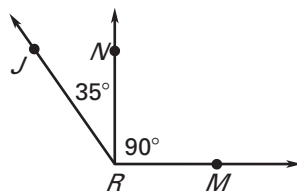
Because $m\angle DBC = 45^\circ$, $\angle DBC$ is an acute angle.

Because $m\angle ABC = 135^\circ$, $\angle ABC$ is an obtuse angle.

Exercises for Example 2

Find the indicated angle measure. Then classify each angle in the diagram as *acute*, *right*, *obtuse*, or *straight*.

4. $m\angle JRN = 35^\circ$ and $m\angle NRM = 90^\circ$.
Find $m\angle JRM$.



5. $m\angle ABD = 60^\circ$ and $m\angle ABC = 180^\circ$.
Find $m\angle DBC$.

