1-4 Angles

An **angle** (\angle) is the figure formed by two rays that have the same endpoint. The two rays are called the **sides** of the angle, and their common endpoint is the **vertex** of the angle.

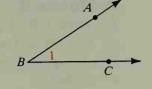
The sides of the angle shown are \overrightarrow{BA} and \overrightarrow{BC} . The vertex is point B. The angle can be called $\angle B$, $\angle ABC$, $\angle CBA$, or $\angle 1$. If three letters are used to name an angle, the middle letter must name the vertex.

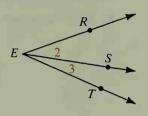
When you talk about this $\angle B$, everyone knows what angle you mean. But if you tried to talk about $\angle E$ in the diagram at the right, people wouldn't know which angle you meant. There are three angles with vertex E. To name any particular one of them you need to use either three letters or a number.

 \angle 2 could also be called \angle *RES* or \angle *SER*.

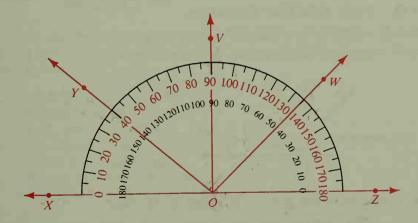
 \angle 3 could also be called \angle SET or \angle TES.

 $\angle RET$ could also be called $\angle TER$.





You can use a protractor like the one shown below to find the *measure* in degrees of an angle. Although angles are sometimes measured in other units, this book will always use degree measure. Using the outer (red) scale of the protractor, you can see that $\angle XOY$ is a 40° angle. You can indicate that the (degree) measure of $\angle XOY$ is 40 by writing $m \angle XOY = 40$.



Using the inner scale of the protractor, you find that:

$$m \angle YOZ = 140$$
 $m \angle WOZ = 45$ $m \angle YOW = 140 - 45 = 95$

Angles are classified according to their measures.

Acute angle: Measure between 0 and 90

Right angle: Measure 90

Obtuse angle: Measure between 90 and 180

Straight angle: Measure 180

Examples: $\angle XOY$ and $\angle VOW$

Examples: $\angle XOV$ and $\angle VOZ$ **Examples:** $\angle XOW$ and $\angle YOW$

Example: $\angle XOZ$