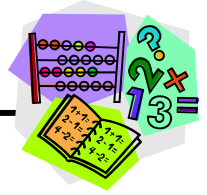
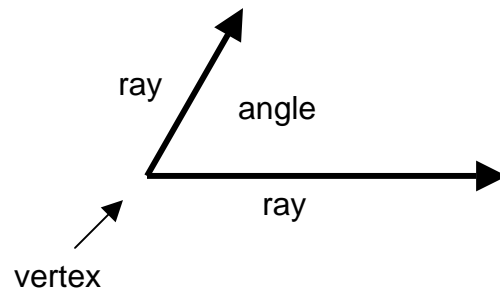


Angles

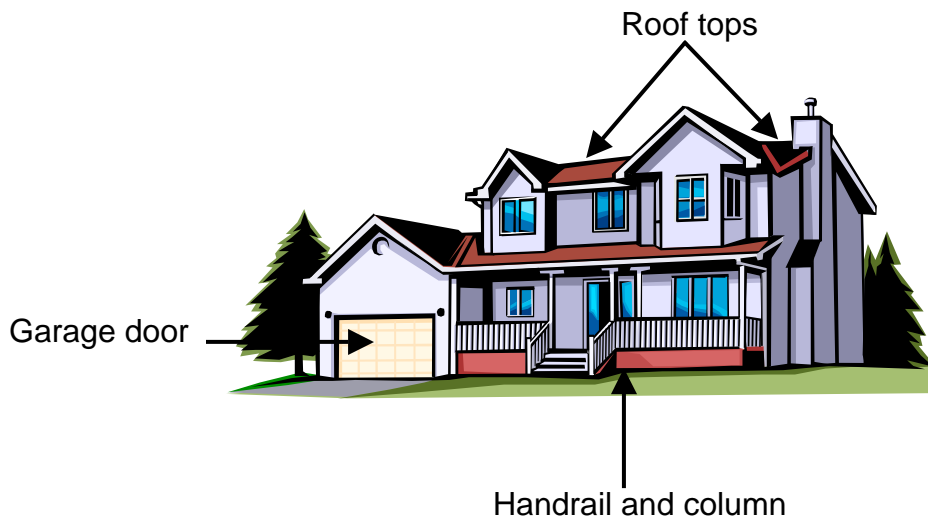


An **angle** is formed when two lines, line segments or rays meet. The point where they meet is called the vertex.



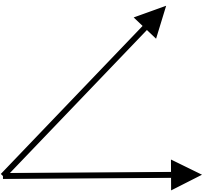
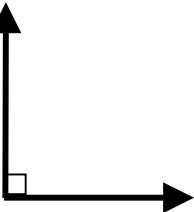

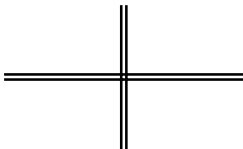
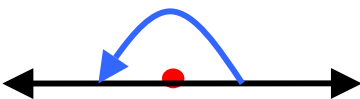
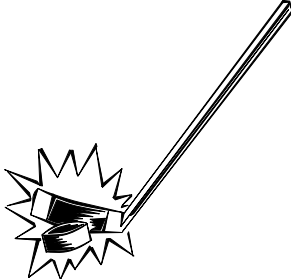
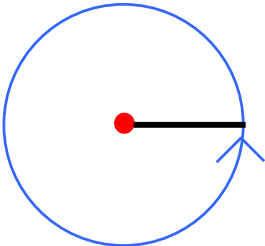

Example

There are many angles in a building. Can you find ten in this picture?



Common Angles

Some of the more common angles we see daily are shown in the table below.

Angle	Illustration	Examples
45°		Pictures, mirrors and door frames are cut at 45° each and joined to form 90° corners.
90°	 The  is used to represent 90°	Intersections where streets and avenues meet.  Steps Where walls meet floors
180°		Straight lines Beams and studs Roadways Ski poles Hockey stick shafts 
360°		All circular objects Tires Ferris wheels Steering wheels 

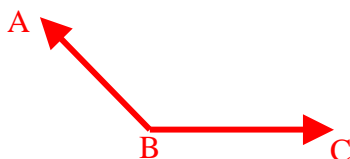
Measuring and Drawing Angles

Angles are measured in units called degrees ($^{\circ}$), using a measuring device called a protractor. A protractor has 180° marked on it.

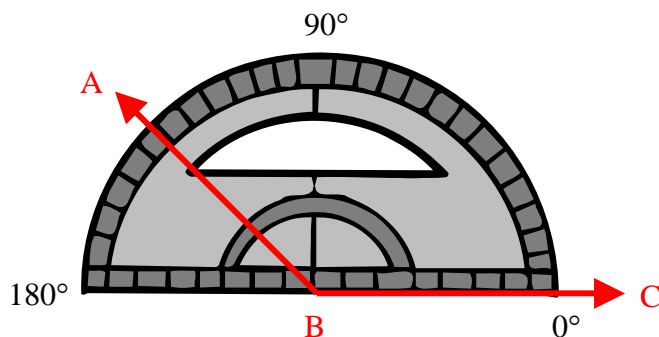


Example

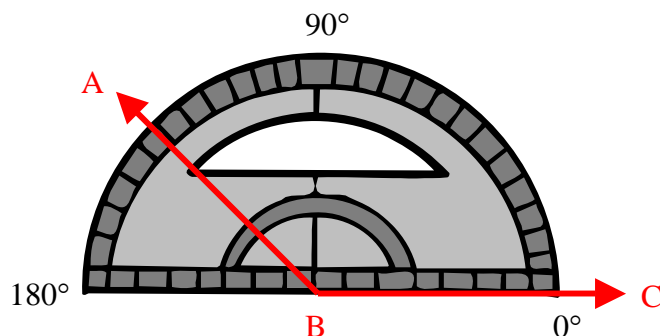
What is the measure of $\angle ABC$?



1. Extend the rays of the angle so it shows outside of the protractor. Place the centre of the protractor on the vertex of the angle AND align one of the rays along the 0° mark at the bottom of the protractor.



2. From the 0° mark, count the number of degrees to the other ray. This is the measure of the angle in degrees.



$\angle ABC$ measures 135° .



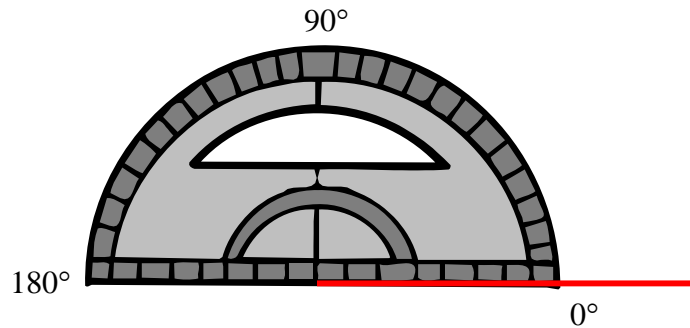
Practice: Drawing Angles Using a Protractor

Follow these steps to draw an angle of 50° .

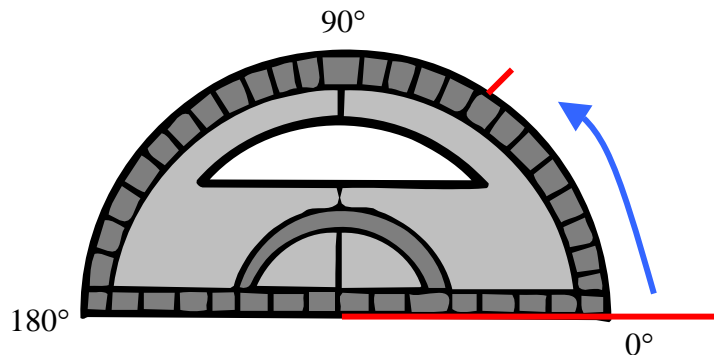
1. Draw a straight line using the bottom of the protractor or a ruler.



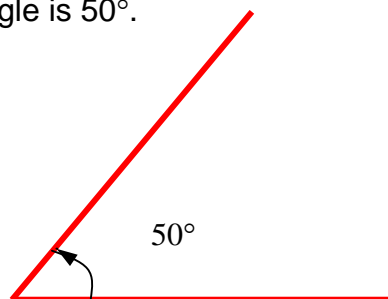
2. Place the centre of the protractor at one end of the line and turn the protractor so that one of the 0° marks is aligned with the other end of the line.



3. Begin where the line is on 0° and measure the desired angle. Mark that spot along the outside edge of the protractor using a pencil.

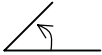
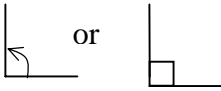
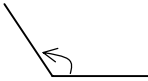




4. Turn the protractor and use a pencil to draw a straight line connecting the vertex and the pencil mark. The angle is 50° .



Classifying Angles

Angles are named according to their size in degrees.

Angle	Diagram	Name
Less than 90°		Acute angle
Exactly 90°		Right angle
Greater than 90° , less than 180°		Obtuse angle
Exactly 180°		Straight angle
Greater than 180° less than 360°		Reflex angle

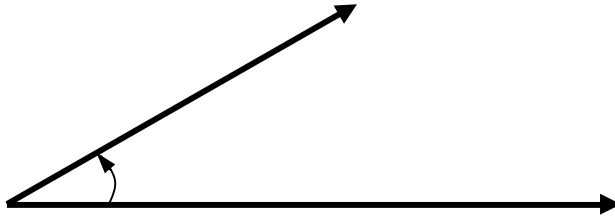
The sum of the angles in a triangle equals 180° .
The sum of the angles in a quadrilateral equals 360° .



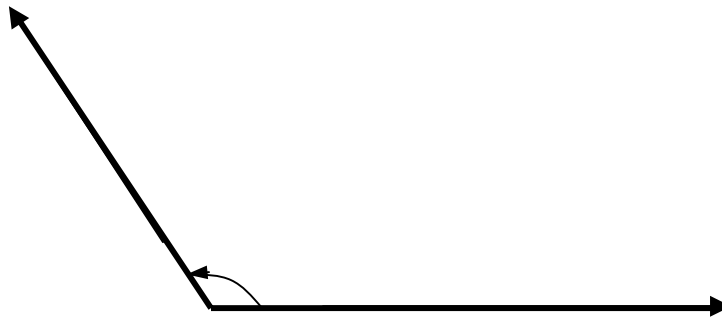
Practice: Angle Practice

1. Measure the following angles. Record each angle and classify.

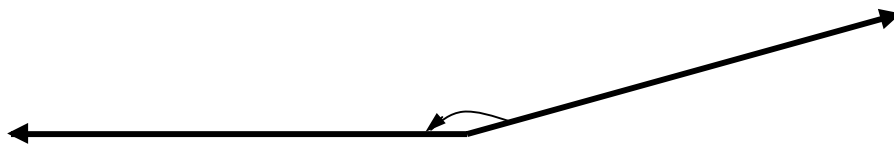
a.



b.



c.



2. Draw and classify the following angles.

a) 60°

b) 35°

c) 125°

d) 70°

e) 95°

f) 135°

g) 25°

h) 10°

3. Use your knowledge of angles to estimate and calculate angles in science class, such as:

- the angle made by earth, you and a star or other night sky object
- angles of reflection and refraction.

Measure angles around the classroom and find as many different angles as you can. Record the angles you find in a chart like the one below.

Where I found angle	Size of angle	Type of angle

4. Visit the Muttart Conservatory in Edmonton, or other buildings. Classify the shapes and objects within the building and those that make up the building.

Think About ...

Angles are very important in the business of construction.

Carpenters must measure the angles to make sure that everything will fit together. For example, you can't make a square room without four angles of 90° .

What other trades people need to measure angles on the job?