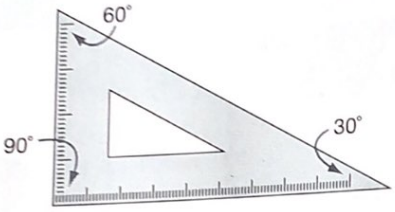
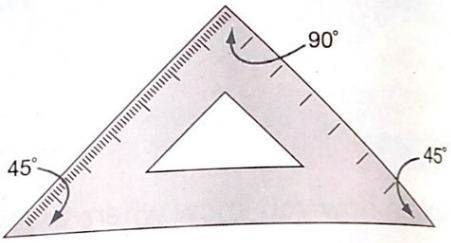
LESSON 5

# Constructing Triangles

These triangles come with a geometry set.
The measure of each angle is shown.



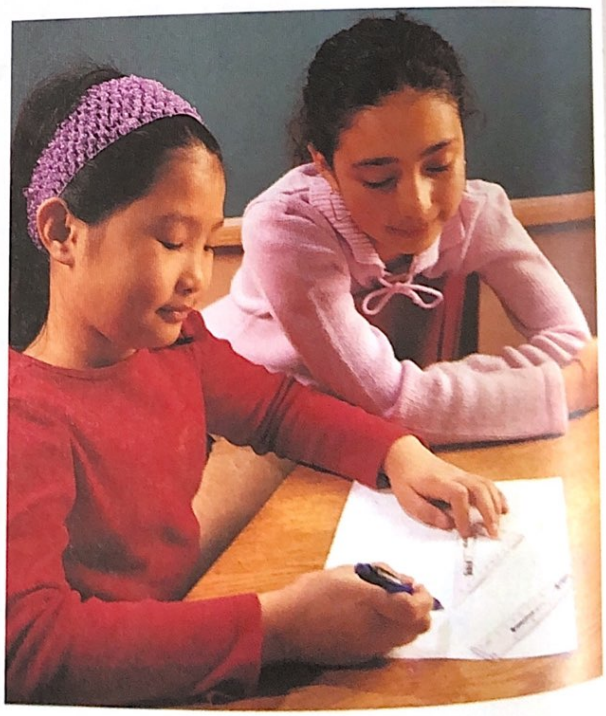

## Explore

You will need:
- a millimetre ruler
- triangles from a geometry set

➤ Construct triangle DEF.
The measure of ∠D is 30°.
The measure of ∠E is 60°.
The measure of ∠F is 90°.
Which side will be the longest?
Try to make more than one triangle DEF.

➤ Construct triangle ABC.
The length of AB is 66 mm.
The measure of ∠A is 120°.
The length of AC is 66 mm.
How long is side BC?
What are the measures of ∠B and ∠C?

➤ Name each triangle 2 ways.
Record your work.





**Lesson Focus** | Construct triangles given side and angle measures.

## Show and Share

Compare your triangles with those of another pair of students.
Is it possible to make different triangles ABC? DEF? Explain.

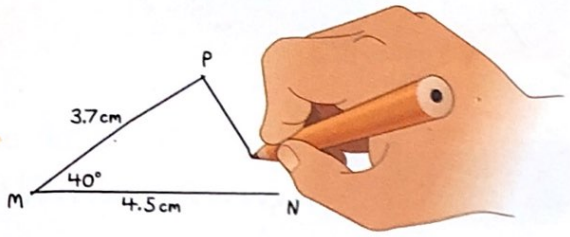
## Connect

You can use a ruler and a protractor to construct a triangle.

Construct triangle MNP.
The length of MN is 4.5 cm.
The measure of ∠M is 40°.
The length of MP is 3.7 cm.

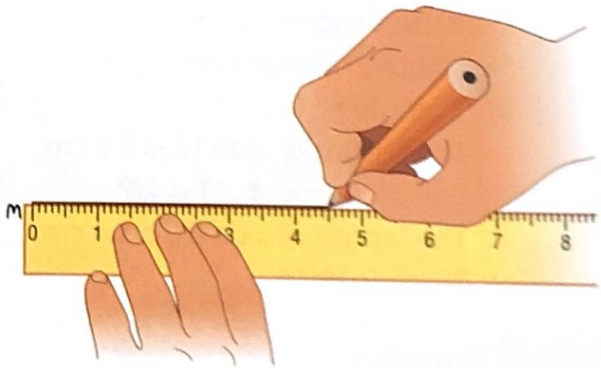
**Step 1**

Sketch the triangle first.
Label each side and angle.
This sketch is *not* accurate.
It shows each given measure.



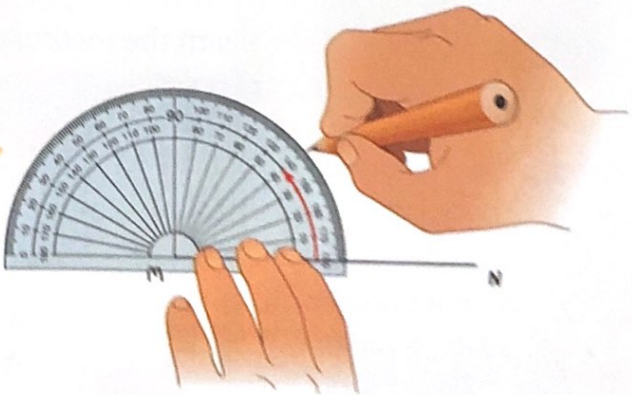

**Step 2**

Use a ruler to draw side MN
4.5 cm long.



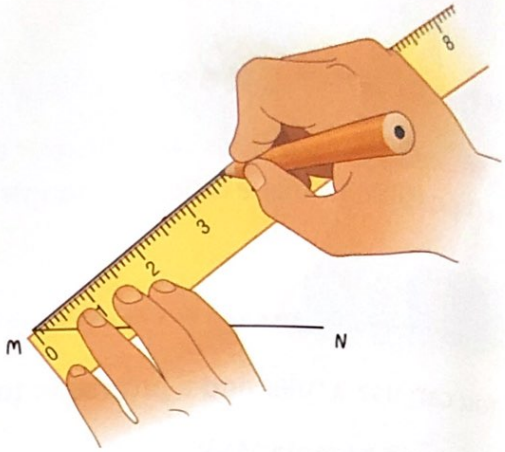

**Step 3**

Place the protractor on MN,
with its centre at M.
From 0° on the inner circle,
measure an angle of 40° at M.



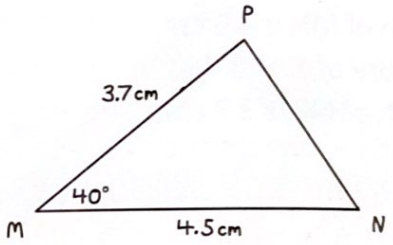
**Step 4**

Remove the protractor.
Join M to the mark at 40°.
Measure 3.7 cm from M.
Mark the point P.




**Step 5**

Use a ruler to join P to N
to form side NP.
Label the triangle with its measures.




## Practice

**1.** Use a ruler and a protractor.
Construct each triangle.
Sketch the triangle first.

**a)** Triangle RST
The length of side TS is 5.2 cm.
The measure of ∠T is 26°.
The length of side RT is 3.4 cm.

**b)** Triangle VWX
The length of side VW is 7 cm.
The measure of ∠V is 60°.
The measure of ∠W is 50°.

Label each triangle with the measures
of all the sides and angles.

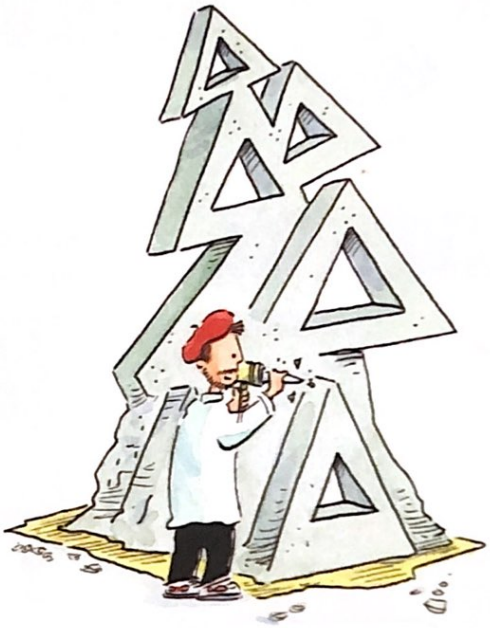
**2.** Use a geoboard or dot paper.
Construct a triangle with two 45° angles.
Do this 3 times to construct 3 different triangles.
How are the triangles the same? Different?

### Numbers Every Day

**Number Strategies**

Use addition, subtraction, multiplication, or division. Find 10 different ways to make 42.

3. Use a ruler and a protractor.
Construct a triangle with angles 40°, 60°, and 80°.
Compare your triangle with that of a classmate.
Are your triangles congruent?
How could you find out?



4. Construct triangle GHK.
The measure of ∠H is 45°.
The length of side HK is 64 mm.
The length of side HG is 46 mm.
   a) What is the measure of ∠K?
   What is the length of side GK?
   b) Suppose the length of side HG is 7 cm.
   What happens to the measure of ∠K?
   What happens to the length of GK?
Show your work.

5. Construct a right triangle with two angles of 55° and 35°.
Can you make more than one triangle? Explain.

6. Try to construct triangle ABC.
Draw AB 42 mm long.
The measure of ∠A is 90°.
The measure of ∠B is 95°.
Can you construct triangle ABC?
How do you know?

7. Can you construct a triangle with three 45° angles?
Explain your thinking.

## Reflect

Which measures do you need to know to be able to draw a triangle?
For each example, draw the triangle.

## At Home

Look for triangles in your home.
They could be pictures or objects with triangular faces.
Name each triangle 2 ways.
Choose 1 triangle. Draw it.