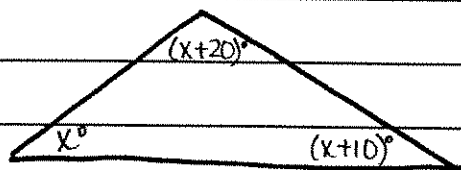


## applications of linear equations part II

(Problems from Geometry)

The sum of three angle measurements in a triangle is  $180^\circ$ .

example 1: Solve for  $x$  given the triangle below. Then find each angle measurement.



Knowing that the sum of three angles in a triangle is  $180^\circ$ , we can set up an equation to solve for  $x$ .

$$x + x + 10 + x + 20 = 180$$

$$3x + 30 = 180$$

$$\begin{array}{r} -30 \quad -30 \\ \hline 3x = 150 \end{array}$$

$$\begin{array}{r} 3 \quad 3 \\ \hline x = 50 \end{array}$$

$$x = 50$$

$$x = 50$$

Since  $x = 50$ , the three angles are  $50^\circ$ ,  $60^\circ$ , and  $70^\circ$ .

Two angles are said to be complementary if their sum is  $90^\circ$ .

Two angles are said to be supplementary if their sum is  $180^\circ$ .

example 2: Find the measure of an angle whose complement is  $30^\circ$  more than its measure.

Let's call the measure of the angle  $x$ . Then we can express its complement  $x + 30$ .

Since the two angles are complementary, their sum must be  $90^\circ$ .

Therefore we get the following equation.

$$x + x + 30 = 90$$

Now we can solve for  $x$ :

$$x + x + 30 = 90$$

$$2x + 30 = 90$$

$$\underline{-30 \quad -30}$$

$$2x = 60$$

$$\underline{2 \quad 2}$$

$$x = 30$$

example 3: Find the measure of an angle whose supplement is four times its measure.

↳ Let  $x$  represent the measure of the angle.

↳ Then  $4x$  represents its supplement.

↳ Since the two angles are supplementary, their sum must be  $180^\circ$ .

Therefore we get the following equation:

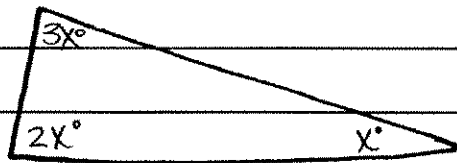
$$x + 4x = 180$$

↳ NOW solve for x:

## APPLICATIONS OF LINEAR EQUATIONS Part II

### Practice Problems

1. Find each angle measurement for the triangle below:



2. Find the measure of an angle whose complement is twice its measure.
3. Find the measure of an angle whose supplement is 9 times its measure.