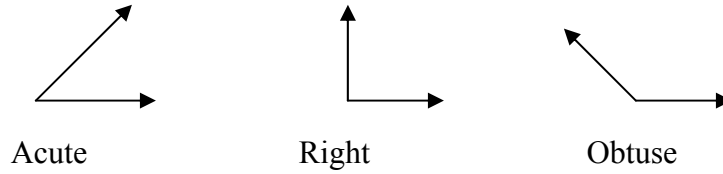


Angles in Mathematics

There are three kinds of angles used in beginning algebra:



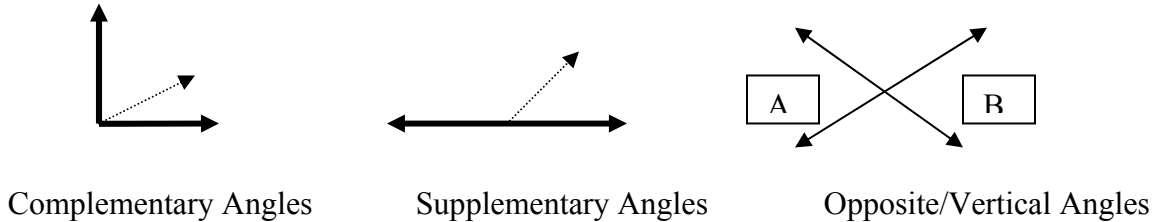
Acute – the angle’s measure is less than 90°

Right – the angle’s measure is exactly 90°

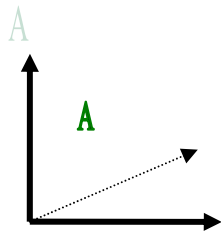
Obtuse – the angle’s measure is more than 90°

A **straight line** has a degree measure of 180°

There are three main ways these types of angles are used in beginning algebra:



Complementary Angles – These are not angles that compliment each other, they complete each other for a total of 90° , a right angle. Given one angle, you can figure out its complement by subtracting the known from 90.

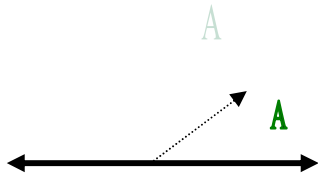


If angle A measures 60° , you can figure out the other angle by taking 90 (the whole big angle) and subtracting 60 from it. The other angle must measure 30° $90 - 60 = 30$

Even if we don’t know the measure of angle A, we can call it A, and get the measure of the other angle: $(90 - A) =$ the other angle.

$$\underline{A + (90 - A) = 90^\circ}$$

Supplementary Angles – These angles total 180° . Given one angle, you can figure out its supplement by subtracting the known angle from 180.



Here, if angle A measures 60° , you can figure out the other angle by taking 180 (the angle measure of the straight line) and subtracting 60 from it. The other angle must measure 120° $180 - 60 = 120$

Even if we don’t know the measure of angle A, we can call it A and get the measure of the other angle: $(180 - A) =$ the other angle.

$$\underline{A + (180 - A) = 180^\circ}$$

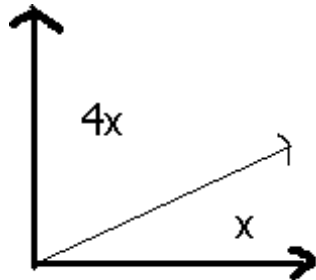
Opposite/Vertical Angles – Using the variety of supplementary angles formed, we can prove that angle A and angle B are equal to each. Given one angle, you then know the measure of its opposite angle is equal. $\underline{A = B}$

Also: The angles of a triangle add up to 180° and the angles of a rectangle add up to 360°

Angles in Equations: Practice Page

1. Find the measure of an angle whose complement is four times its measure.

Draw a Picture:



$$\begin{aligned} 4x + x &= 90 \\ 5x &= 90 \\ \frac{5x}{5} &= \frac{90}{5} \\ x &= 18 \end{aligned}$$

The angle measures 18°

OR Translate:

“complement is four times its measure” (the angle’s)

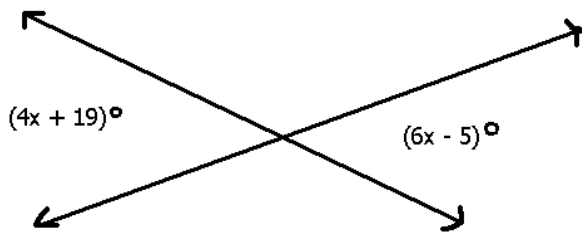
$$90 - x = 4 * x$$

$$\begin{aligned} 90 - x &= 4x \\ + x &+ x \\ 90 &= 5x \\ \frac{90}{5} &= \frac{5x}{5} \\ 18 &= x \end{aligned}$$

The angle measures 18°

1. Find the measure of an angle whose complement is 12 more than its measure.

2.



These are opposite (or vertical) angles, which are always equal to each other.

$$4x + 19 = 6x - 5$$

$$-6x \quad -6x$$

$$-2x + 19 = -5$$

$$-19 \quad -19$$

$$-2x = -24$$

$$\frac{-2x}{-2} = \frac{-24}{-2}$$

$$-2 \quad -2$$

$$x = 12$$

But we’re not done. The angles measure the same amount, but x is only part of them. Pick one

$$4x + 19 \rightarrow 4(12) + 19 \rightarrow 48 + 19 \rightarrow 67$$

OR $6x - 5 \rightarrow 6(12) - 5 \rightarrow 72 - 5 \rightarrow 67$

The angles each measure 67°

2.

