

Complementary and Supplementary Angles



Identify complementary and supplementary angles.
Find measures of complementary and supplementary angles.

Warm Up:

- 1) Find the complement and supplement of a 35° angle.

$$90 - 35$$

$$\boxed{55^\circ}$$

$$180 - 35$$

$$\boxed{145^\circ}$$

- 2) Write an *expression* in simplest form for the supplement and complement of $x + 35$

$$90 - (x + 35)$$

$$90 - x - 35$$

$$\boxed{(55 - x)^\circ}$$

$$180 - (x + 35)$$

$$180 - x - 35$$

$$\boxed{(145 - x)^\circ}$$

If an angle measures x° , then...

the complement of the angle is $(90 - x)^\circ$ and the supplement of the angle is $(180 - x)^\circ$

- 3) The supplement of an angle is 70° greater than the measure of the angle. Find the measure of the larger angle.

$$180 - x = x + 70$$

$$110 = 2x$$

$$55 = x$$

$$\text{smaller } \angle = 55^\circ$$

$$\text{larger } \angle = 180 - 55 = 145^\circ$$

$$\boxed{145^\circ}$$

- 4) An angle measure is 3 degrees less than twice the measure of its complement. Find the measure of its complement.

$$x = 2(90 - x) - 3$$

$$x = 180 - 2x - 3$$

$$3x = 177$$

$$x = 59$$

$$\text{angle} = 59^\circ$$

$$\text{Comp} = \begin{array}{r} 90 \\ - 59 \\ \hline 31 \end{array}$$

$$\boxed{31^\circ}$$

Small Group Practice

- 5) An angle's measure is 12 degrees more than $\frac{1}{2}$ the measure of its supplement. Find the measure of the angle.

$$x = \frac{1}{2}(180 - x) + 12$$

$$x = 90 - \frac{1}{2}x + 12$$

$$\frac{2}{2} \cdot \frac{2}{2} x = 102 \cdot \frac{2}{2}$$

$$x = 68$$

angle = 68°

- 6) The complement of angle is 3 more than twice the measure of the angle. Find the measure of the complement.

$$90 - x = 2x + 3$$

$$-3x = -87$$

$$x = 29$$

angle = 29°
comp = 61°

- 7) An angle is 3 more than twice the measure of its supplement. Find the measure of the supplement.

$$x = 2(180 - x) + 3$$

$$x = 360 - 2x + 3$$

$$3x = 363$$

$$x = 121$$

angle = 121°
supp = $180 - 121$
= 59°

- 8) The measure of the complement of an angle is six more than twice the measure of the angle. Find the measure of the angle.

$$90 - x = 2x + 6$$

$$-3x = -84$$

$$x = 28$$

angle = 28°

- 9) The measure of the supplement of an angle is 30° less than five times the measure of the complement. Find the measure of the supplement.

$$180 - x = 5(90 - x) - 30$$

$$180 - x = 450 - 5x - 30$$

$$180 + 4x = 420$$

$$4x = 240$$

$$x = 60$$

angle = 60°
supp = $180 - 60$
= 120°