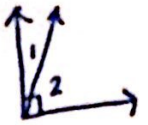
Day 2 - Supplementary and Complementary Angles

Complementary Angles: Two or more angles whose sum of measures equals 90°.

40° and 50° angles are complementary angles because 40° + 50° = 90°.

Example: A 30° angle is called the complement of the 60° angle.
Similarly, the 60° angle is the complement of the 30° angle.

Complementary Angles



$\angle 1 + \angle 2 = 90°$

Practice: Find the **complement** of each angle.

a. 35°

$90 - 35 = 55°$

b. 67°

$90 - 67 = 23°$

c. 81.5°

$90 - 81.5 = 8.5°$

d. Two angles, 2x° and 3x° are complementary. Find the value of x and each angle.

$2x + 3x = 90$

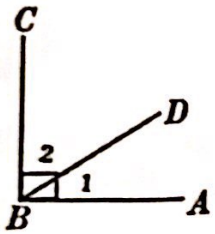
$5x = 90$

$x = 18$

$2(18) = 36°$

$3(18) = 54°$

e. $\angle 1$ and $\angle 2$ are complementary. Solve for x and the measure of both angles.



$\angle 1 = 5x + 2$

$\angle 2 = 2x + 4$

$\angle 1 + \angle 2 = 90$

$5x + 2 + 2x + 4 = 90$

$7x + 6 = 90$

$7x = 84$

$x = 12$

$\angle 1 = 5(12) + 2$

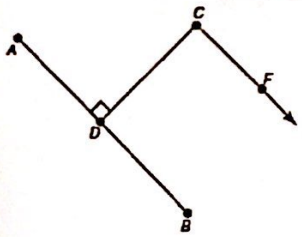
$\angle 1 = 62°$

$\angle 2 = 2(12) + 4$

$\angle 2 = 28°$

Perpendicular: Two lines, rays, or segments that intersect to form a 90° angle.

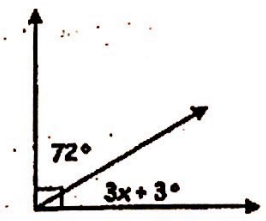
a. Name all the angles you know are right angles.



$\angle ADC$

$\angle BDC$

b. Solve for x.



$3x + 3 + 72 = 90$

$3x + 75 = 90$

$3x = 15$

$\boxed{x = 5}$

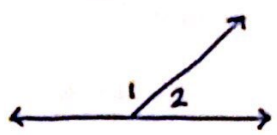
Supplementary Angles

Supplementary Angles: Two or more angles whose sum of measures equals 180°.

60° and 120° angles are supplementary angles because 60° + 120° = 180°.

Example: A 70° angle is called the supplement of the 110° angle.
Similarly, the 110° angle is the supplement of the 70° angle.

Supplementary Angles



$\angle 1 + \angle 2 = 180°$

Practice: Find the **supplement** of each angle.

a.) 126°

$180 - 126 = 54°$

b. 35°

$180 - 35 = 145°$

c. 123.4°

$180 - 123.4 = 56.6°$

d. Two angles, 4x° and 6x° are supplementary. Find the value of x and each angle.

$4x + 6x = 180$

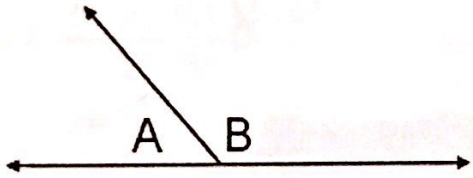
$10x = 180$

$x = 18$

$4(18) = 72°$

$6(18) = 108°$

e. $\angle A$ and $\angle B$ are supplementary. Solve for x and the measure of both angles.



$\angle A = 12x + 4$

$\angle B = 9x + 2$

$\angle A + \angle B = 180$

$12x + 4 + 9x + 2 = 180$

$21x + 6 = 180$

$21x = 174$

$x = 8.3$

$\angle A = 12(8.3) + 4$

$\angle A = 103.6°$

$\angle B = 9(8.3) + 4$

$\angle B = 76.7°$

f. **Think about it!**

Can two supplementary angles both be obtuse angles? Why or Why Not?

No, because obtuse angles are greater than 90°. Two angles are greater than 90° will add more than 180°.
(to)

Can two supplementary angles both be acute angles? Why or Why Not?

No, because acute angles are less than 90°. If two angles are less than 90°, they will add to less than 180°.

Can two supplementary angles both be right angles? Why?

Yes because two angles that both equal 90°, will equal 180° when added together.