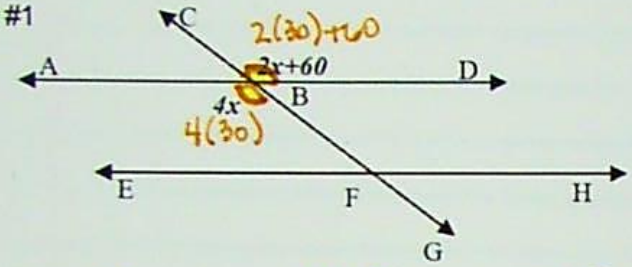
Finding Unknown Angle Measures

5 Easy STEPS:
1) Identify the angle type
2) ≅ or Supp
3) Write equation
4) Solve equation for x
5) Calculate angles

We will use the angle relationships that are formed when two parallel lines are intersected by a transversal to find the measures of missing angles. All of the angle relationships will either be supplementary or congruent.

Example A: The pair of angles are either vertical angles, alternate interior angles, alternate exterior angles, or corresponding angles, so they are congruent. All you have to do is set up and solve an equation where the expressions are congruent. Once you have solved for x, substitute that value back into each expression to find the measure of each angle.

#1

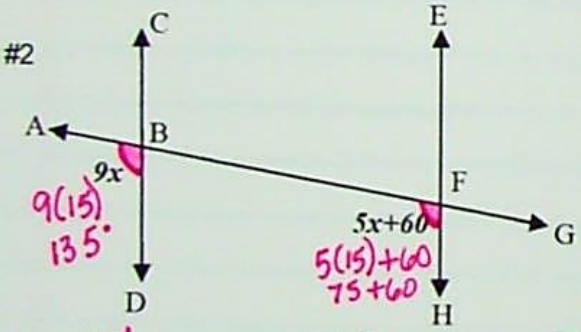


x = 30 ∠AOG = 120° ∠CBD = 120°

Relationship: Vertical Angles (≅)

Equation:
$4x = 2x + 60$
$-2x \quad -2x$
$\frac{2x}{2} = \frac{60}{2}$
$x = 30$

#2



x = 15 ∠ABD = 135° ∠HFA = 135°

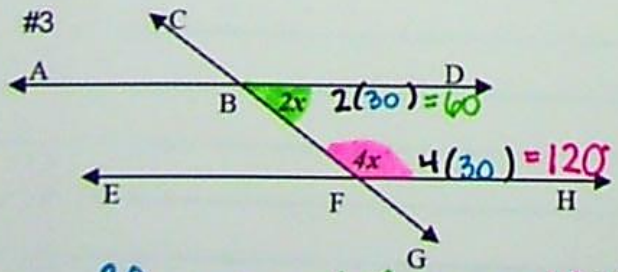
Relationship: Corresponding Angles (≅)

Equation:
$9x = 5x + 60$
$-5x \quad -5x$
$\frac{4x}{4} = \frac{60}{4}$
$x = 15$

Example B: Each pair of angles are supplementary to each other, which means the angles add up to 180°. All you have to do is set up and solve an equation where the expressions add up to equal 180°. Once you have solved for x, substitute that value back into each expression to find the measure of each angle.

= 180

#3



x = 30 ∠FBD = 60° ∠HFB = 120°

Relationship: Supplementary (=180)

Equation:
$2x + 4x = 180$
$\frac{6x}{6} = \frac{180}{6}$
$x = 30$