More Geometry Examples

Example 1: Identify Angle Parts

Name an angle pair that satisfies each condition.

a. two obtuse vertical angles

Solve

 $\angle DFB$ and $\angle AFE$ are vertical angles. They each have measures greater than 90, so they are obtuse.

b. Name a segment that is perpendicular to \overline{FC} .

 \overline{AD} is perpendicular to \overline{FC} . The intersection has a right angle symbol so they are perpendicular.



Example 2: Angle Measure **ALGEBRA** - The measure of the supplement of an angle is 60 less than three times the measure of the complement of the angle. Find the measure of the angle.

Explore Let x represent the measure of the angle. Then 90 - x is the measure of its complement, and 180 - x is the measure of its supplement. "Boxer Method" below:

The Angle	X	
Complement	90 - x	
Supplement	180 – x	

Plan Write an equation using expressions from table above.

The supplement 60 less than three times the complement is 180 - x3(90 - x) - 60=180 - x = 3(90 - x) - 60**Original equation** 180 - x = 270 - 3x - 60**Distributive Property** 180 - x = 210 - 3xSimplify. Subtract 180 from each side. -x = 30 - 3x2x = 30Add 3x to each side. x = 15Divide each side by 2.

Now fill in the measures in table 🔍

Angle	х	15	
Comp	90 - 15	75	
Supp	180 – 15	165	

Examine If the measure of the angle is 15, then:

The supplement	is	60 less than three times the complement
(165)	=	$[3(75) - 60] \leftarrow$ go straight to this, or
180 - 15	=	$3(90-15)-60 \leftarrow$ substitute 15 for x into original equation
165	=	3(75) - 60
165	=	225 - 60
165	=	165 (check!)

More Geometry Examples Example 3: Perpendicular Lines

ALGEBRA - Find x and y so that

DG and BE are perpendicular.

If $DG \perp BE$, then $m \angle DFB = 90$ and $m \angle GFE = 90$. To find x, use $\angle BFC$ and $\angle DFC$. $m \angle BFC + m \angle DFC = 90$ Sum of parts = whole 2x + 4x = 90 Substitution 6x = 90 Add. x = 15 Divide each side by 6.



 $m \angle GFE = 90$ Given5y + 20 = 90Substitution5y = 70Subtract 20 from each side.y = 14Divide each side by 5.



Example 4: Interpret Figures Determine whether each statement can be assumed from the figure.

- a. $\angle BFC$ and $\angle AFG$ are complementary. No; they are congruent, but we do not know anything about their exact measurements.
- ∠DFA and ∠AFG are a linear pair. Yes; they are adjacent angles whose noncommon sides are opposite rays.
- c. $\angle DFC$ and $\angle BFC$ are complementary. Yes; there is a right angle symbol showing the adjacent angles form a right angle.

