Math 9 – Plane Geometry

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Lesson #1: Angles

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In Plane Geometry, we are going to look at angles, triangles, and parallel lines. Within each of these, we are going to define and analyze different theorems which are statements of truth within Plane Geometry. Much of this could be review for you. Please ensure that you are also practicing and reviewing for the exam.

First, let's draw and define the 5 different types of angles.

1. **Acute**

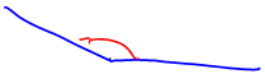
less than 90°

2. **Right**

is 90°

3. **Obtuse**

greater than 90°



4. **Straight**

180°

5. **Reflex**

"opposite" outside the angle

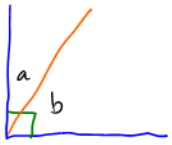
In this lesson, there are three theorems that we will explore. When you are solving questions, you must do two things. The first is to give an answer. The second is to state the theorem that you enacted to validate your solution.

1. **Supplementary Angle Theorem (SAT)**

$a + b = 180°$

→ a and b are called supplementary angles, and they add up to 180°

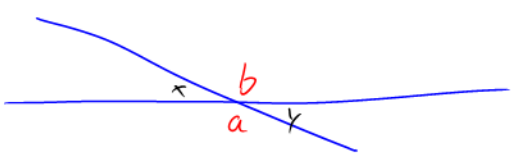
2. **Complementary Angle Theorem (CAT)**



$a + b = 90°$

→ a and b are called complementary angles and they add up to 90°

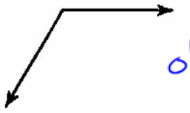
3. **Opposite Angle Theorem (OAT)**



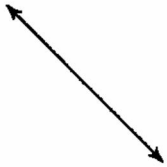
$a = b$

→ when two lines cross, the opposite angles are equal.

Classify each angle as acute, obtuse, right, or straight.

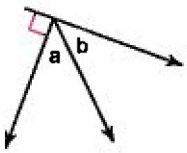
1) 

obtuse, greater than 90°

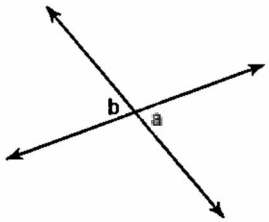
2) 

Straight.

Name the relationship: complementary,supplementary, or opposite.

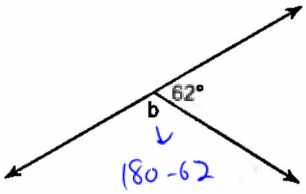
3) 

complementary

4) 

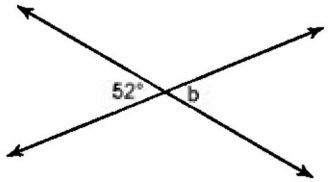
opposite.

Find the measure of angle b.

5) 

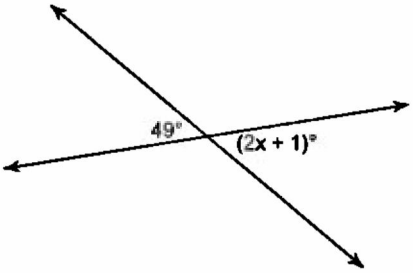
180 - 62
= 118°

b = 118°, SAT

6) 

b = 52°, OAT

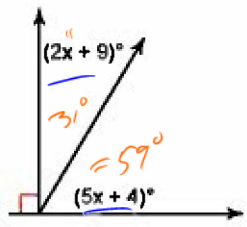
Find the value of x. First state the theorem you are using.

7) 

$2x+1 = 49$, OAT

$\frac{2x}{2} = \frac{48}{2}$

$x = 24°$

8) 

$2x+9 + 5x+4 = 90$, CAT

$7x + 13 = 90$

$-13 \quad -13$

$\frac{7x}{7} = \frac{77}{7}$

$x = 11°$