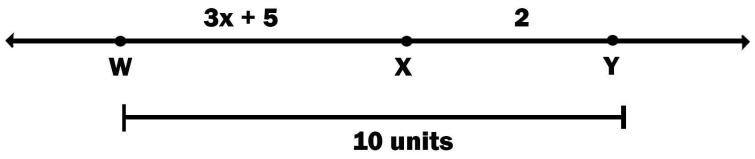
Introduction to Geometry

Answer Key

1) Answer: D
Explanation: The statements in option A to C are included in Euclid's five postulates. Meanwhile, the statement in letter D is not. Basically, it is just a logical conclusion based on the definition that a bisector divides a line segment into two congruent segments.

2) Answer: D

Explanation: Illustrating the given problem:



By the segment addition postulate, we can conclude that length of the entire segment WY is equal to the sum of the lengths of WX and XY.

Mathematically:

$$WX + XY = WY$$

Substituting the lengths of the respective segments:

$$(3x + 5) + (2) = 10$$
$$3x + 7 = 10$$

We can now solve for the value of *x* using the derived equation above:

3x + 7 = 10

3x = -7 + 10 *Transposition method*

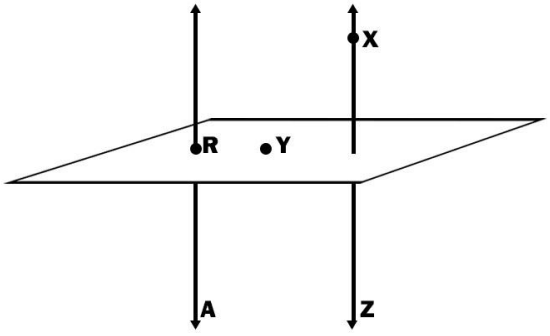
3x = 3

$\frac{3x}{3} = \frac{3}{3}$ *Dividing both sides of the equation by 3*

x = 1

Thus, the value of *x* is 1.

3) Answer: B
Explanation: Among the given statements, only statement III "The line containing point A is parallel with the line containing point X" is true. As you can see in the given illustration (shown below), the line where A is located is parallel to the line where X is located. Recall that parallel lines means non-intersecting lines.



Introduction to Geometry

Answer Key

4) Answer: B
Explanation: Among the given statements, only statements I and III are true.

We will explain this answer by falsifying statements II and IV.

Statement II is false since not all plane figures are polygon. A circle is a plane figure but it is not a polygon.

Meanwhile, statement IV is false because the intersection of a line and a line segment is not necessarily the midpoint of the line segment. The statement could be true if the line is a line bisector but the statement didn't specify whether the line is a bisector or not, so the statement is false.

5) Answer: C
Explanation: The number of diagonals that a polygon has can be determined using the formula below:

Number of diagonals = $\frac{n(n-3)}{2}$

where n is the number of sides of the polygon.

A dodecagon is a polygon with 12 sides. So, we will use n = 12 in the formula.

Substituting n = 12 in the formula above:

Number of diagonals = $\frac{n(n-3)}{2}$

Number of diagonals = $\frac{(12)(12-3)}{2}$

Introduction to Geometry

Answer Key

Number of diagonals = $\frac{(12)(9)}{2}$

Number of diagonals = $\frac{108}{2}$

Number of diagonals = 54

Thus, a dodecagon has 54 diagonals.