

Chapter 1 – Tools For Geometry

1.1

Undefined terms in geometry: point, line, and plane

Point indicates a location. It has no dimension, is represented by a dot.

Line is represented by a straight path that extends indefinitely in two directions and has no thickness or width. A line contains infinite many points.

Plane is represented by a flat surface that extends without end in two dimensions and has not thickness. A plane contains infinite many points.

collinear points - points that lie on the same line.

Coplanar - coplanar points are points that lie in the same plane.

Space - space is the set of all points

Segment - Two points and all the points between them.

Ray - a segment that is extended indefinitely in one direction

Opposite rays - two collinear rays that extend in opposite directions

Postulate – a conditional statement that is accepted as being true.

Postulate 1-1 – Through any two points is exactly one line.

Postulate 1-2 – If two lines intersect, then their intersection is exactly one point.

Postulate 1-3 – If two planes intersect, then their intersection is a line.

Postulate 1-4 – Through any three noncollinear points there is exactly one plane.

Terms, Postulates and Theorems

1.2

Congruent Segments – $\overline{OX} \cong \overline{EN}$ iff $OX = EN$

Definition of Midpoint - If M is the midpoint of \overline{PQ} , then M is the point between P and Q such that $PM = MQ$.

Segment Bisector - any segment, line, or plane that intersects a segment at its midpoint.

Midpoint in the Coordinate Plane - The coordinates of the midpoint of a line segment whose endpoints have coordinates (x_1, y_1) and (x_2, y_2)

$$M = \left(\frac{\Sigma x}{2}, \frac{\Sigma y}{2} \right)$$

Distance formula - The distance, d, between any points with coordinates (x_1, y_1) and (x_2, y_2) is given by the following formula:

$$d = \sqrt{[\Delta x]^2 + [\Delta y]^2}$$

1.3

Ray: a segment that is extended indefinitely in one direction

Vertex: the endpoint of a ray

Angle: a figure that consists of two rays with a common endpoint

Sides: the two rays of an angle

Measure of an angle: the number of degrees in an angle

Opposite rays: two collinear rays that extend in opposite directions

Straight angle: the figure formed by two opposite rays

Acute Angle: an angle whose measure is less than 90 and greater than zero.

Obtuse Angle: an angle whose measure is greater than 90 and less than 180.

Right Angle: an angle whose measure is 90.

Congruent Angles – $\angle CAT \cong \angle DOG$ iff $m\angle CAT = m\angle DOG$

Angle Bisector: a line, ray, or segment that separates an angle into two congruent angles.

1.4

Segment – A segment consists of two endpoints and all the points between them.

Segment Addition Postulate – A is between C and T iff $CA + AT = CT$.

Angle Addition Postulate – R is in the interior of $\angle PQS$ iff $m\angle PQR + m\angle RQS = m\angle PQS$.

1.5

Postulate – A statement that assumed to be true.

Theorem – A statement that can be proved true using established facts.

Adjacent Angles – two angles that have the same vertex, share common ray, and have no common interior points.

Complementary Angles – two angles that sum to 90° .

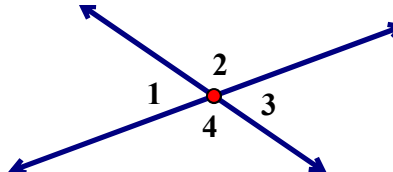
Complement Theorem – If the noncommon sides of two adjacent angles form a right angle, then the angles are complementary.

Supplementary Angles – two angles that sum to 180° .

Linear Pair – two adjacent angles whose non-common sides form opposite rays (form a straight angle).

Supplement Theorem – If two angles form a linear pair, then they are supplementary.

Vertical Angles - two nonadjacent angles formed by intersecting lines.



Vertical Angles Theorem: Vertical angles are congruent.

