Geometry
Big Ideas Chapter 1 Study Guide - Basics of Geometry

## Definitions

**Undefined terms**: point, line, and plane. Building blocks of geometry, cannot be defined using other figures.
**Distance**: The absolute value of the difference of the coordinates of points A and B.
**Midpoint**: The point on a segment that divides the segment into two congruent segments.
**Congruent ($\cong$)**: The description of two geometric figures which have the same size and shape.

**Segment bisector**: Anything that divides a segment into two equal lengths.
**Angle bisector**: A segment, line, or ray through the vertex of an angle that divides the angle into two equal measures.
**Complementary Angles**: Two angles whose measures have a sum of 90°.
**Supplementary Angles**: Two angles whose measures have a sum of 180°.
**Adjacent Angles**: Two coplanar angles that share a common vertex and side, but have no common interior points.
**Vertical Angles**: Two nonadjacent angles formed by two intersecting lines.
**Linear Pair**: Two adjacent angles when their non-common sides are opposite rays.
**Polygon**: A closed plane figure formed by three or more line segments.
**Convex vs. Concave**: Convex describes a polygon in which no diagonals fall outside the polygon. Concave describes a polygon in which at least one diagonal falls outside the polygon.
**Types of Polygons**: Triangle, Quadrilateral, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, Decagon, Dodecagon, n-gon
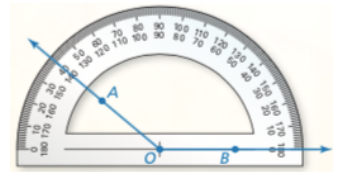
## Postulates

**Ruler Postulate**: The points on a line can be matched one to one with the real numbers. The real number that corresponds to a point is the coordinate of the point.
**Segment Addition Postulate**: If B is between A and C, then
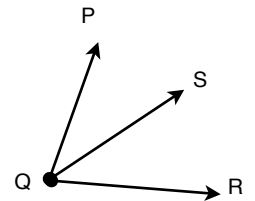$m\overline{AB} + m\overline{BC} = m\overline{AC}$.
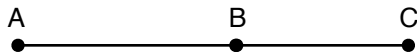
**Protractor Postulate**

The rays of the form $\overrightarrow{OA}$ can be matched one to one with the real numbers from 0 to 180.

**Angle Addition Postulate** If S is in the interior of $\angle PQR$, then $m\angle PQS + m\angle SQR = m\angle PQR$.
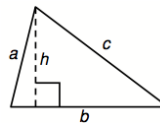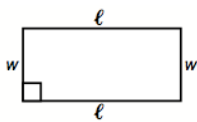
## Formulas

Distance Formula: $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

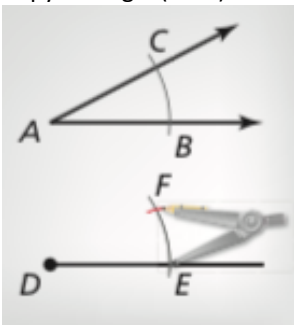Midpoint Formula: $M\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}\right)$

Rectangle: $P = 2l + 2w$ $A = l \cdot w$
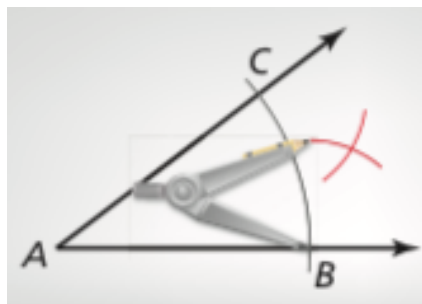
Triangle: $P = a + b + c$ $A = \dfrac{1}{2}bh$

## Constructions

Copy an angle (P. 40)

Bisect an angle (P. 42)

Geometry                                           Name _____

Big Ideas Chapter 1 Practice Problems             Date _____ Period _____

**Show all work!!!**

1) Jordan wants to adjust the shelves in his bookcase so that there is twice as much space on the bottom shelf as on the top shelf, and the middle shelf is one and a half times the space of the top shelf. If the total height of the bookcase is 0.9 meter, how much space is the middle shelf on? Draw a picture and solve.

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Use the figure for 2 and 3.

2) If $m\angle LKH = m\angle JKL + 20°$ and $m\angle HKG = 37°$, what is $m\angle GKL$?

3) Find $m\angle JKH$.

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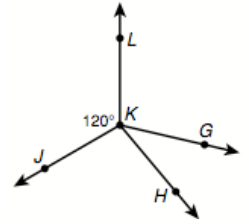
4) $\overrightarrow{VX}$ bisect $\angle WVY$, $m\angle WVX = (6x)°$, and $m\angle WVY = (16x - 42)°$. What is the value of x? Draw the figure and solve.

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5) $\angle DEF$ and $\angle FEG$ are complementary. $m\angle DEF = (3x - 4)°$, and $m\angle FEG = (5x + 6)°$. Find the measure of both angles. Draw a figure and solve.

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6) Find the length of the sides of a square whose area and perimeter are the same nonzero number.

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7) A rectangular box of tissues is 9.5 inches long, 4.5 inches wide, and 4 inches high. Find the area of the surface of the box. Draw the figure and solve.

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Use the figure for 8 and 9.

8) Find the congruent sides of $\triangle ABC$.

9) Find the coordinate of the midpoint to $\overline{AB}$.