

Sec. 1.1

• **Point**: A location, named by capital letters

Ex: • K

• **Line**: Made up of points that extend in 2 directions.

Named by 2 points Ex: 

• **Plane**: Flat surface made up of points that extends in all directions. (Also has rays, lines, ect.) Goes on forever.

Name planes by 3 points or a capital letter in the corner

• 2 lines intersect to make a point 

• 2 planes will always intersect at a line

• **Collinear**: Points on a same line

- Ex:  ✓ Ex: x, s, z X = Noncollinear

• **Coplanar**: Points, segments, and lines on the same plane

- Ex:



Section 1.2 ~ Linear Measure

• **Betweenness**: A point between 2 points. 

$\cong$ means congruent; use tick marks for congruency

Ex: 

Ex:  $\overline{xy} = 3a$ $\overline{yz} = 14$
 $\overline{xz} = 5a - y$

$$5a - 4 = 5a - y \text{ so } y = 4$$

$$3a + 14 = 5a - 4$$

$$\begin{array}{r} 3a + 14 = 5a - 4 \\ -3a \quad -3a \\ \hline 14 = 2a \end{array}$$

$$\frac{14}{2} = \frac{2a}{2}$$

$$7 = a$$

$$5(9) - 4$$

$$45 - 4 = 41 \quad \overline{xz} = 41$$

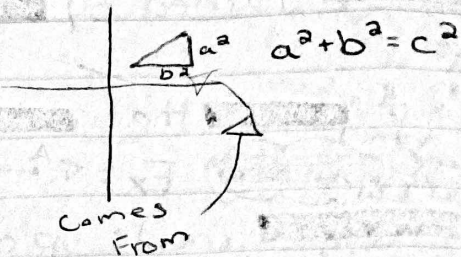
$$xy + yz = xz$$

$$3a + 14 = 5a - 4$$

$$3(9) = 27 = xy$$

Sec. 1.3: Distance/Midpoints

Ex) $\overline{AB}$ starts at 3
 $13 - 3 = 10$



Distance Formula:

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Ex) Find dist between $(-2, 4)$ and $(-5, -7)$
 $x_1 \ y_1 \quad x_2 \ y_2$

$$D = \sqrt{(-5 - (-2))^2 + (-7 - 4)^2}$$

$$(-3)^2 + (-11)^2$$

$$9 + 121$$

$$\sqrt{130}$$

$$\begin{array}{c} 10 \quad 13 \\ \swarrow \quad \searrow \\ 2 \quad 11 \end{array}$$

$$\begin{array}{r} 11 \\ 11 \\ \hline 121 \end{array}$$

Ex) Find midpoint

$$\begin{array}{c} 7.5 \quad 7.5 \\ \hline 5 \quad 12.5 \quad 20 \end{array} \quad \text{or} \quad \frac{20+5}{2}$$

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

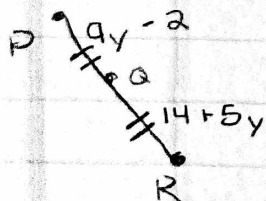
Find the midpoint of $(-3, 6)$ and $(4, -2)$
 $x_1 \ y_1 \quad x_2 \ y_2$

$$\frac{-3 + 4}{2} = \frac{1}{2}$$

$$\frac{6 + (-2)}{2} = \frac{4}{2} = 2$$

$$\left(\frac{1}{2}, 2 \right)$$

EX) Find PQ if Q is the midpoint



$$ay - 2 = 14 + 5y$$

$$\begin{array}{r} -5y \\ \hline 4y - 2 = 14 \end{array}$$

$$4y - 2 = 14$$

$$+2 \quad +2$$

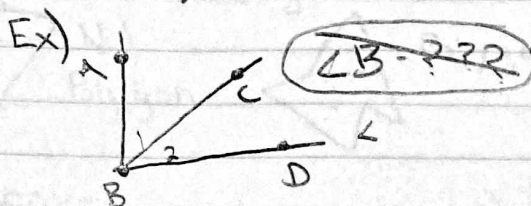
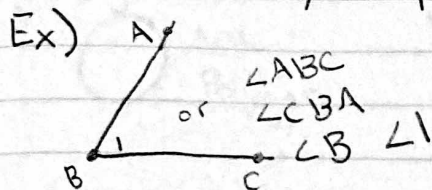
$$4y = 16$$

$$4 \quad 4$$

$$y = 4$$

Sec. 1.4: Angle Measure

Name $\angle$'s by 3 pts or vertex



Acute Angle: Angle that is less than 90° greater than 0° . $0^\circ < \text{angle} < 90^\circ$

Obtuse Angle: More than 90° but less than 180° . $90^\circ < \text{angle} < 180^\circ$

Ex) $\angle A$ is an acute angle that measures $2x + 4$

Find values for x $0^\circ < x < 90^\circ$

$$2x + 4 > 0 \quad \text{and} \quad 2x + 4 < 90$$

$$\begin{array}{r} 2x > -4 \\ \frac{2x}{2} > \frac{-4}{2} \\ x > -2 \end{array}$$

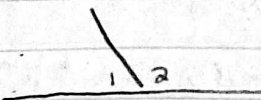
$$\begin{array}{r} 2x < 86 \\ \frac{2x}{2} < \frac{86}{2} \\ x < 43 \end{array}$$

$$-2 < x < 43$$

Sec. 1.5: Angle Relationships ^{Not always reversible}

Th¹: If 2 $\angle$'s are right angle then they are congruent.

Th²: Linear Pair:



$\angle 1$ and $\angle 2$ are a linear pair

If 2 angles are a linear pair then they are supplementary

Th³: Vertical Angles:



$\angle 1$ and $\angle 2$ are considered vertical angles

If 2 angles are vertical angles then they are congruent

★ Th⁴: Transitive Property:

If $a=b$ and $b=c$, then $a=c$

Reason: Transitive

Ex) $\angle x \cong \angle y$

$\angle w \cong \angle x$

C: $\angle w \cong \angle y$

R: Transitive Property

g: $a+b=180$

$x+y=180$

C: $a+b=x+y$

R: Transitive Property

Ex) $\overline{ab} \cong \overline{xy}$

$\overline{ab} \cong \overline{mn}$

C: $\overline{xy} \cong \overline{mn}$

R: Transitive Property

g: $\overline{ab}=8$

$\overline{cd}=8$

C: $\overline{ab} \cong \overline{cd}$

R: Transitive

Th⁵: Substitution: Is for equations

Ex) If $a+b=c$ and $b=x$ then $a+x=c$

R: Substitution

Th⁶: Reflexive Property:

Anything is congruent to itself
(Segments/Angles)

Ex) $\angle A \cong \angle A$

Reflexive

$\overline{AB} \cong \overline{AB}$

Reflexive

Sec. 1.6 - Perimeter Area

- Polygon: Closed figure made of segments



Not -
Polygon



Not
Polygon



Polygon

Concave



"Makescave"

Convex



+ Equilateral: All sides are congruent

+ Equiangular: All angles congruent

+ Regular: All sides and all angles are congruent

Perimeter: Distance around

Area: Space inside

Circumference: Distance around circle $C = 2\pi r$
 $= \pi d$

Area of Triangle: $\frac{1}{2}bh$



Area of Square = bh

Area of Circle = πr^2

Area of Rectangle = bh