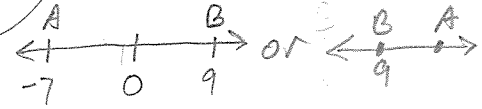
Geometry (H) Name: KEY

Section 1.1 - Ruler Postulate and the Segment Addition Postulate

Length of a segment – distance between 2 points

how many?

Ex 1: AB = 16. The coordinate of B is 9. Find all possible coordinates of A.



$A-B=16$ OR $B-A=16$

$A-9=16$ $9-A=16$

$A=25$ $A=-7$

Use abs. value!

$|A-9|=16$

$A-9=16$ $A-9=-16$

$A=25$ $A=-7$

Ruler Postulate:

The points on a line can be paired with the real numbers such that the **distance between any two points** is the absolute value of the difference of their coordinates.

measures

Ex 2: GH = 6. The coordinate of G is 2x – 6. The coordinate of H is x – 5. Find all possible values of G.

or

$|(2x-6)-(x-5)|=6$

$|2x-6-x+5|=6$

$|x-1|=6$

$x-1=6$

$x=7$

$G=8$

$H=2$

$|(x-5)-(2x-6)|=6$

$|x-5-2x+6|=6$

$|-x+1|=6$

$-x+1=6$

$-x=5$

$x=-5$

check

$H=-10$

$|-16--10|=6$

$-10--16=6$

G

$2(-5)-6$

$-10-6$

-16

$G=-16$

G

$2(7)-6$

$14-6$

8

Ex 3: XY = 11. The coordinate of X is 2x + 3 and the coordinate of Y is 4x – 1. Find all possible values of Y.

$XY=11$

$|2x+3-(4x-1)|=11$

$|2x+3-4x+1|=11$

$|-2x+4|=11$

$-2x=7$

$x=-\frac{7}{2}$

Y

$4\left(-\frac{7}{2}\right)-1$

$-14-1$

-15

$Y=-15$

$x=-4$ ✓

$YX=11$

$-2x+4=-11$

$-2x=-15$

$x=\frac{15}{2}$

Y

$4\left(\frac{15}{2}\right)-1$

29

$Y=29$

$x=18$ ✓

*Stress solving of an abs. value EQ.

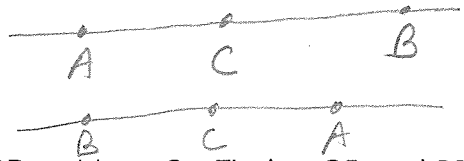
important to have these measure of

Segment Addition Postulate: If B is between A and C then AB + BC = AC.

only case:

then $AB + BC = AC$

if not, then possible



Ex 3: Q is between P and R. PQ = 3, QR = 2x + 5, PR = 11x + 2. Find x, QR and PR.

Set-up: $PQ + QR = PR$

$3 + 2x + 5 = 11x + 2$

$6 = 9x$

$\frac{2}{3} \leftarrow \frac{6}{9} = x$

$QR = 2\left(\frac{2}{3}\right) + 5$

$= \frac{4}{3} + 5$

$QR = \frac{19}{3}$ or $6\frac{1}{3}$

$PR = 11\left(\frac{2}{3}\right) +$

$= \frac{22}{3} + \frac{6}{3}$

$PR = \frac{28}{3}$ or $9\frac{1}{3}$

Ex 4: B is between A and C. $AB = x^2$, $BC = 2x$ and $AC = 15$. Find AB and BC.

$AB + BC = AC$

$x^2 + 2x = 15$

$x^2 + 2x - 15 = 0$

$(x + 5)(x - 3) = 0$

$x = -5, \quad x = 3$

Now what?

$x = -5$

$AB = (-5)^2 = 25$

$BC = 2(-5) = -10$

OMIT $x = -5$

$x = 3$

$AB = 3^2 = 9$

$BC = 2(3) = 6$

Keep

$AB = 9$

$BC = 6$

Ex 5: B is between A and C. Find AB and BC.

$AB = 2x^2$, $BC = -3x$ and $AC = 9$. Try each x:

$2x^2 - 3x = 9$

$2x^2 - 3x - 9 = 0$

$(2x + 3)(x - 3) = 0$

$x = -\frac{3}{2} \quad x = 3$

$x = -\frac{3}{2}$

$AB = 2\left(-\frac{3}{2}\right)^2$

$2\left(\frac{9}{4}\right) = \frac{9}{2}$

$BC = -3\left(-\frac{3}{2}\right) = \frac{9}{2}$

$x = 3$

$AB = 2(9) = 18$

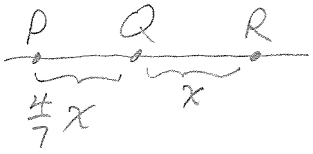
$BC = -3(3) = -9$

OMIT

$AB = \frac{9}{2}$

$BC = \frac{9}{2}$

Ex 6: P, Q and R are collinear points such that Q is between P and R. $PQ = \frac{4}{7}QR$ and PR = 33. Find QR.



$\frac{4}{7}x + x = 33$

$\frac{11}{7}x = 33$

$33\left(\frac{7}{11}\right)$

$x = 21$

$QR = 21$

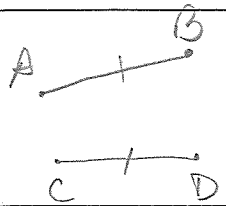
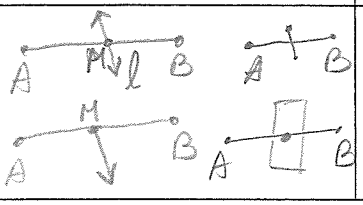
Ck: Find PQ, see if sum = 33

$PQ = \frac{4}{7}(21) = 12$

$12 + 21 = 33$

$33 = 33$

Congruent – objects that have the same size & shape

TERM	DRAWING	DEFINITION	WORDS/SYMBOLS
Congruent Segments		segs that are = in length	$\overline{AB} \cong \overline{CD}$
Midpoint of a Segment		A pt that divides a segment into 2 ≅ segments.	M midpt of $\overline{AB}$.
Bisector of a Segment		A line, segment, ray or plane that intersects the seg at its midpt.	l bisect $\overline{AB}$ at P

Determine if the following statements are **Sometimes, Always** or **Never** true.

1. The length of a segment is __N__ negative.
2. If point S is between R and V, then S __always__ lies on $\overline{RV}$.
3. A coordinate can __A__ be paired with a point on a number line. (ruler)
4. The bisector of a segment is __S__ a line.
5. A ray __N__ has a midpoint.
6. Congruent segments __A__ have equal length.
7. $\overline{AB}$ and $\overline{BA}$ __N__ denote the same ray.