Name: _____

Segment Relationships: Class Work

1. Find the measure of $\overline{BC}$ if B is the midpoint of $\overline{AC}$.

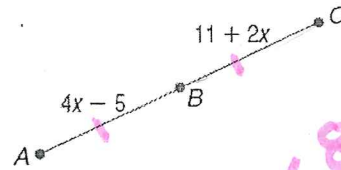11 + 2x •C
4x − 5 •B
A•

$AB = BC$ def of midpt

$4x - 5 = 11 + 2x$ Substitution
$-2x \qquad -2x$

$2x - 5 = 11$ Subtraction
$+5 \quad +5$

$2x = 16$ addition
$\overline{2} \qquad \overline{2}$

$x = 8$ division

$BC = 11 + 2x$
$BC = 11 + 2 \cdot 8$
$\boxed{BC = 27}$ ←8

Find the value of the variable and ST if S is between R and T. Justify your steps.

2. $RS = 7a, ST = 12a, RT = 76$

$RS + ST = RT$ Segment addition

$7a + 12a = 76$ Substitution

$\boxed{19a = 76}$ CLT-Substion
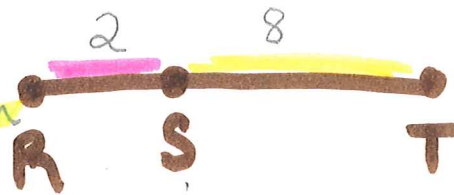
$\boxed{a = 4}$ division

$ST = 12 \cdot a$

$ST = 12 \cdot 4$ $\boxed{ST = 48}$

2   8
R   S   T

$RS + ST = RT$
$2 + 8 = 10$

3. $RS = 12, ST = 2x, RT = 34$

$RS + ST = RT$ Segment addition

$12 + 2x = 34$ substitution

$2x = 22$ subtraction
$\overline{2} \quad \overline{2}$

$\boxed{x = 11}$ division

$ST = 2(11)$ $\boxed{ST = 22}$

4. $RS = 4y - 1, ST = 2y - 1, RT = 5y$

$RS + ST = RT$ segment addition

$\boxed{4y} - 1 + \boxed{2y} - 1 = 5y$ Substitution

$6y - 2 = 5y$ CLT-
$-6y \qquad -6y$

$\dfrac{-2}{-1} = \dfrac{-1y}{-1}$ subtraction

$\boxed{2 = y}$ division

$ST = 2y - 1$
$ST = 2 \cdot 2 - 1$
$\boxed{ST = 3}$

Name: _____

Find the value of the variable and BC if B is between A and C. Justify your steps.

5. $AB = 6x$, $BC = 2x$, $AC = 96$

A   B   C

$AB + BC = AC$ Segment addition

$6x + 2x = 96$ Substitution

$8x = 96$ CLT

$x = 12$ division

$BC = 24$

6. $AB = 21$, $BC = 3a$, $AC = 36$

$AB + BC = AC$ Segment addition

$21 + 3a = 36$ Substitution

$3a = 15$ subtraction

$a = 5$ division

$BC = 15$

7. $AB = 6y + 2$, $BC = 2y - 6$, $AC = 3y$

$AB + BC = AC$ Segment addition

$6y + 2 + 2y - 6 = 3y$ Substitution

$8y - 4 = 3y$ CLT

$-4 = -5y$ Subtraction

$\dfrac{4}{5} = y$ division

$.8 = y$ OR

$B = 2 \times .8 - 6$

$BC = 2 \cdot \dfrac{4}{5} - 6$

$BC = \dfrac{-22}{5}$ or -4.4