Segment Addition Postulate –

Part + Part = whole

$1 + 2 + 3 = $ whole

$\rightarrow$ on the same line

Ex. 1. S, D, and T are collinear, and S is between D and T. If DT = 40, DS = 2x -8, and ST = 3x – 12, find x, DS, and ST.
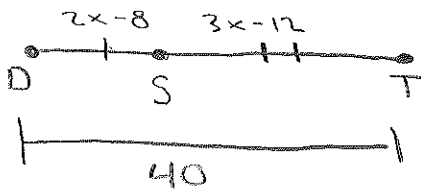
$2x - 8 + 3x - 12 = 40$

$5x - 20 = 40$
$ +20 \quad +20$

$\dfrac{5x}{5} = \dfrac{60}{5} = 12$

$x = 12$
$DS = 16$
$St = 12$

$2x - 8$
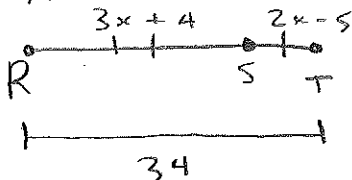$2(12) - 8 = 16$

$3(12) - 12$
$24 - 12$
12

Ex. 2. S, R, and T are collinear, and S is between R and T. If RS = 3x + 4, ST = 2x – 5, and RT = 34, find x and ST.

$2x - 5$
$= 2(7) - 5$
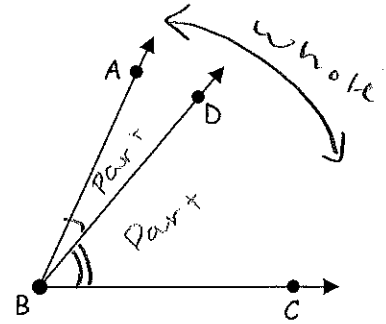$14 - 5 = 9$

$x = 7$
$st = 9$

$3x + 4 + 2x - 5 = 34$

$5x - 1 = 34$
$ +1 \quad +1$
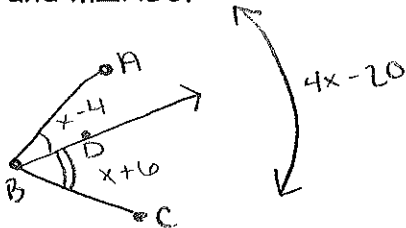
$\dfrac{5x}{5} = \dfrac{35}{5} = 7$

Angle Addition Postulate -

Part + part = Whole

Ex. 3) Point D is in the interior of $\angle ABC$. $m\angle ABC = 4x - 20$, $m\angle ABD = x - 4$, $m\angle DBC = x + 6$.
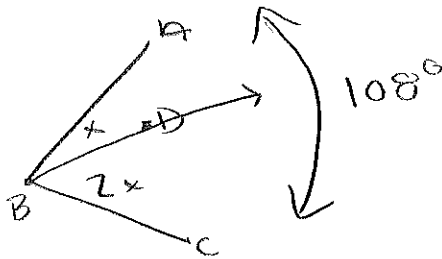Find x and $m\angle ABC$.

$x = 11$

$abc = 24$

$x - 4 + x + 6 = 4x - 20$

$\underset{-2x \quad\quad -2x}{4x - 20 = 2x + 2}$

$\frac{2x}{2} = \frac{22}{2} = 11$

$2x - 20 = 2$

Ex 4) Point D is in the interior of $\angle ABC$. $m\angle ABC = 108°$, $m\angle ABD = x$, and $m\angle DBC$ is 2 times
bigger than $m\angle ABD$. Find x and $m\angle DBC$.

$x + 2x = 108$

$\frac{3x}{3} = \frac{108}{3} = 36$

$x = 36$

$DBC = 72°$

$2(36) = 72°$

Geometry   Name: _____

Worksheet 1-2   Date: _____ Period:_____

Use the Four-Step Problem-Solving Procedure for each problem. Write your final answers in the appropriate blank.

Segment Addition Postulate

1. S is between D and T. If DT = 60, DS = 2x -8, and ST = 3x – 12, find x, DS, and ST.

$2x-8+3x-12=60$

$5x-20=60$

$+20 +20$

$\overline{5x=80}$ $x=16$

x = __16__

DS = __24__

ST = __36__

32 60 $3(16)-12$

$2(16)-8=24$ $\frac{48}{-12}$ 32
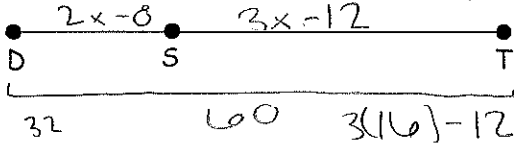
2. F is between E and G. If EF = 4x – 20, FG = 2x +30, and EG = 100, find x and FG.

$4x-20+2x+30=100$

$6x+10=100$

$-10   -10$

$\frac{6x}{6}=\frac{90}{6}$ $x=15$

X = __15__
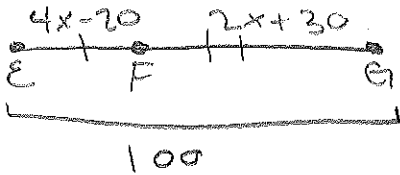
FG = __60__

3. S is between R and T. If RS = 3x + 1, ST = 2x – 2, and RT = 64, find x and ST.

$3x+1+2x-2=64$

$5x-1=64$

$+1   +1$

$5x=\frac{65}{5}$ $x=13$

X = __13__

ST = __24__

$2(13)-2$
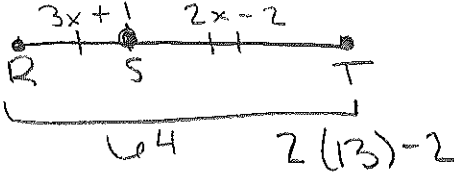
4. M is between A and B and M is the midpoint of $\overline{AB}$. If AM = 3x – 1 and AB = 40, find x and BM.

$3x-1+3x-1=40$

$6x-2=40$

$+2   +2$

$\frac{6x=42}{6}\quad\frac{}{6}$

X = __7__

BM = __20__

$3(7)-1$

20
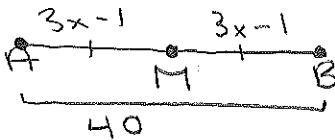
Angle Addition Postulate (Use picture to the right for #5 – 6)

5. m∠ADC = 5x - 20, m∠ADB = x - 4, m∠ BDC = x + 5. Find x and m∠ADC.

$x-4+x+5$ $3x=21$

$5x-20=2x+1$ $x=7$

$-2x   -2x$

$3x-20=1$

$5(7)-20$

X = __7__

m∠ADC = __1__

6. m∠ADC = 116°, m∠ ADB = x, m∠ BDC is 3 times bigger than m∠ ADB.
   Find x and m∠BDC.

$x+3x=116$

$\frac{4x}{4}=\frac{116}{4}$ $x=29$

X = __29__
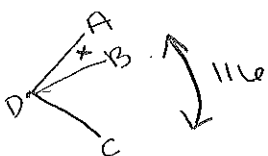
m∠BDC = __87__
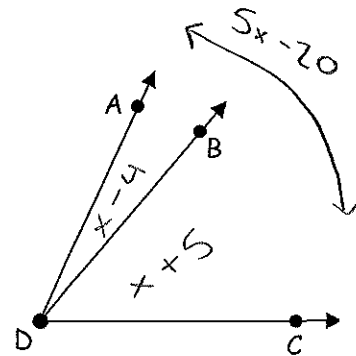
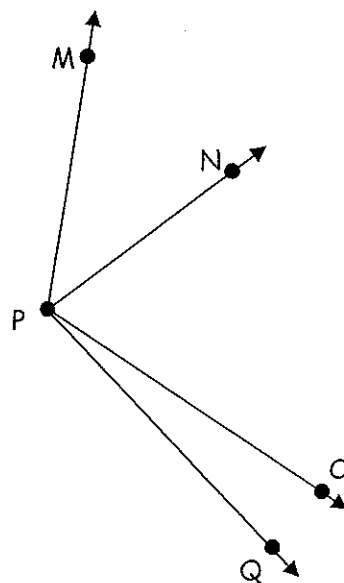## Angle Addition cont'd. (Use picture to the right for #7 – 9)

7. $m\angle MPQ = 10x + 8$, $m\angle MPN = 2x$, $m\angle NPO = 3(x + 9)$, and $m\angle OPQ = 4x - 4$. Find x and $m\angle NPO$.

X = _____

$m\angle NPO = $ _____

8. $m\angle QPO = 4x - 4$, $m\angle OPN = 16x$, $m\angle QPN = 96°$. Find x.

X = _____

9. $m\angle QPN = 96°$, $m\angle OPM = 82°$, and $\angle QPM = 118°$. Find $\angle OPN$

$m\angle OPN = $ _____

10. $m\angle XYW = \frac{1}{2}x + 4$, $m\angle WYZ = \frac{3}{4}x - 6$, and $m\angle XYZ = 2x - 47$.
What is $m\angle XYW$?

$m\angle XYW = $

_____