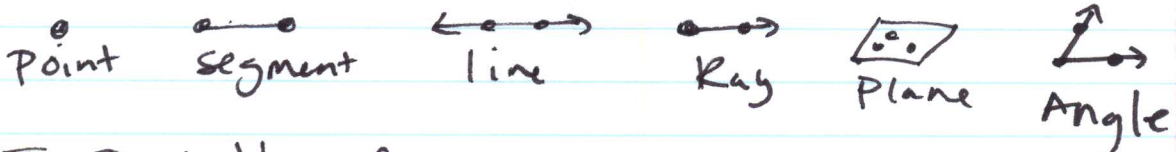
1-1 Basic Figures & Their Names

I. Basic Figures



II. Details of a...

A. point 1. looks like: •

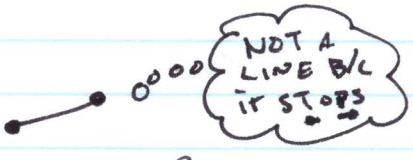
2. needs 1 pt

3. named with 1 letter

ex/ • T ... point T

a.k.a. "T"

B. Segment

1. looks like: 

2. Needs 2 points & is straight

3. named with 2 letters & a segment hat —

ex/ 

$\overline{AM}$ or $\overline{MA}$

4. to write its measure or length, take off the hat!

ex/ 

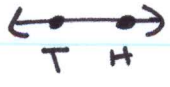
LENGTH: $MA = 3$ NAMES: $\overline{MA}$ or $\overline{AM}$

C. Line

1. looks like 

2. Needs 2 points, is straight, & goes on forever

3. NAMED with 2 letters & a line hat OR its nickname

ex/ 

$\overleftrightarrow{TH}$ OR $\overleftrightarrow{HT}$

D. Ray

1. looks like → or ← or ↕ (one • one →)
2. Needs 1 endpt where it STARTS & 1 through point.
3. Name with 2 letters (START WITH ENDPT!) & a ray hat (always →)

ex/

$\overrightarrow{SI}$ NOT ~~$\overrightarrow{IS}$ OR $\overleftarrow{IS}$ OR $\overleftarrow{SI}$~~

E. Plane

1. looks like ▱
2. Needs 3 pts & is a flat surface
   (not in a line! NON COLLINEAR)
3. Name with 3 ~~points~~ letters & ▱ symbol out front or nickname!

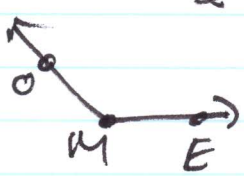
ex/

▱AWE ▱WAE ▱EAW ▱AEW ▱WEA ▱EWA or ▱S

F. Angle

1. looks like ∠
2. Needs 3 pts (corner pt called "vertex") & bends into 2 straight paths w/ →s
3. Name with 3 letters OR corner letter & ∠ symbol out front

ex/



∠OME ∠MEO ∠EOM ∠OEM ∠MOE ∠EMO or ∠M

4. To write "measure of...", stick an "m" before the symbol.

ex/

= m∠OME or m∠M etc.

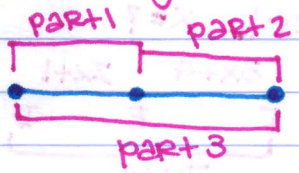
August 20, 2013

Segment Addition

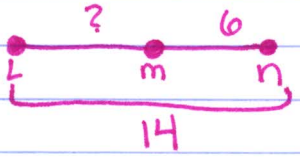
(when you add connected segments)

I. How to add 'em:

part 1 + part 2 = whole



Ex/

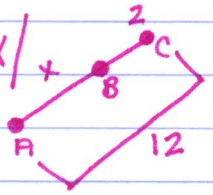


$LM+MN=LN$

$?+6=14$

$?=8$

Ex/



$x+2=12$

$x=10$

$AB=10$

$AB+BC=AC$

Ex/

$5+3x=11$

$-5 \quad -5$

$\frac{3x}{3}=\frac{6}{3}$

$RS+ST=RT$

$5+3x=11$

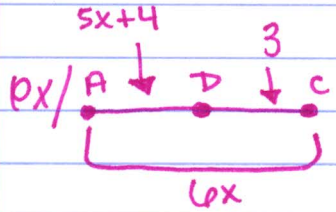
$x=2$

$ST=3x$

$ST=3(2)$

$=6$

Ex/



$AD+DC=AC$

$(5x+4)+3=6x$

$5x+7=6x$

$7=x$

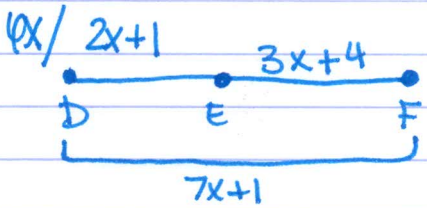
$AD=5(x+4)=5(7)+4$

$=35+4$

$=39$

$AC=6x=6(7)=42$

Ex/



$DE+EF=DF$

$(2x+1)+(3x+4)=7x+1$

$5x+5=7x+1$

$DE=2x+1$

$=2(2)+1=5$

$5=2x+1$

$\frac{4}{2}=\frac{2x}{2}$

$2=x$

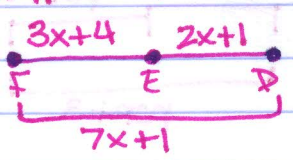
$EF=3x+4$

$=3(2)+4=10$

$DF=7x+1$

$=7(2)+1=15$

Ex/ E is between D and F.
DE is $2x+1$, EF is $3x+4$ and
DF is $7x+1$. $x=?$



$FE + ED = FD$

$(3x+4) + (2x+1) = 7x+1$

$5x+5 = 7x+1$

$5x+4 = 7x$

$4 = 2x$

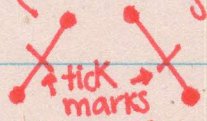
$2 = x$

$x = 2$

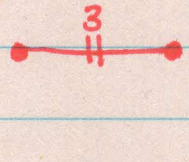
August 21, 2013

Congruent Segments

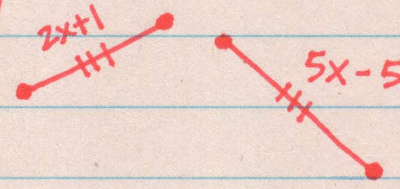
I. Congruent ($\cong$) (same shape, size)



means "congruent"

Ex/ 

$3 = 3$

Ex/ 

$2x+1 = 5x-5$

$1 = 3x-5$

$6 = 3x$

$2 = x$

$2x+1 = 2(2)+1$

$= 4+1$

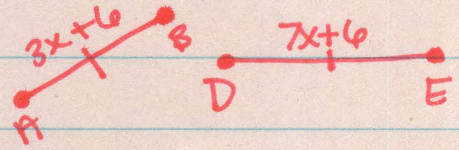
$= 5$

Ex/ $AB = 3x+6$ & $DE = 7x-6$

$DE = ?$

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

$AB = DE$



$DE = 7x-6$

$= 7(3)-6$

$= 21-6$

$= 15$

$3x+6 = 7x-6$

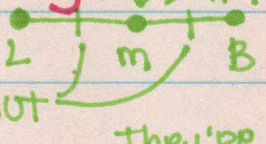
$6 = 4x-6$

$12 = 4x$

$3 = x$

$x = 3$

Midpoint

Ex/ 

But

$LM + MB = LB$

But... LB ??????

They're $\cong$!

$\overline{LM} \cong \overline{MB}$

$LM = MB$

$3x = 5x-4$

$-2x = -4$

$x = \frac{-4}{-2}$ (2)

$LM = 3x$

$LM = 3(2)$

$= 6$

$MB = 5(2)-4$

$MB = 6$

SAME!!!

$LM + MB = LB$

$6 + 6 = LB$

$12 = LB$

Midpoints and Congruence

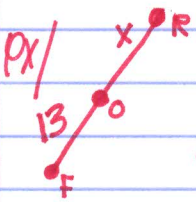
I. Midpoints (Bisector)

A the point in the middle (EXACTLY)

→ creates 2 equal segments!

→ the whole segment is 2 times 1 apart!

Px/



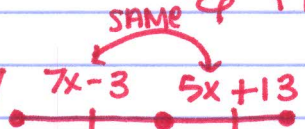
O is the midpoint

so... FO = 13 & OR = 13

b/c FO = OR

& FR = 26 = 2(13)

Px/



$7x - 3 = 5x + 13$

$-5x$

$2x - 3 = 13$

$2x = 16$

$x = 8$

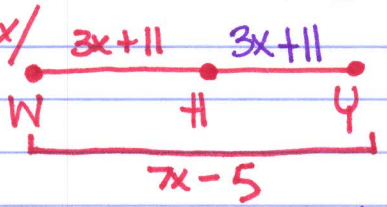
$HA = 7(8) - 3$

$56 - 3$

$HA = 53 \rightarrow AT = 53$

$HT = 53 + 53 = 106$

Px/



H is the midpoint

$x = 27$

$WH = 3(27) + 11 = 81 + 11$

$WH = 92$

$WY = 184$

$HY = 92$

because H is the midpoint we know WH = HY

Now it's segment addition:

$3x + 11 + 3x + 11 = 7x - 5$

$6x + 22 = 7x - 5$

We know

$2(WH) = WY$

$2(3x + 11) = 7x - 5$

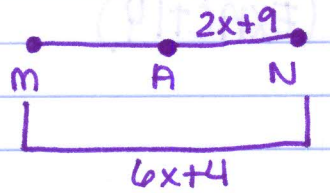
$6x + 22 = 7x - 5$

$22 = x - 5$

$27 = x$

ex/ A is the midpoint of $\overline{MN}$

$AN = 2x+9$ & $\overline{MN} = 6x+4$ $MA = ?$



$2(2x+9) = 6x+4$

$4x+18 = 6x+4$

$-4 \quad\quad -4x$

$18 = 2x+4$

$-4 \quad\quad -4$

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

$7 = x$

$MA = 2x+9$

$2(7)+9$

$= 14+9 = 23$

August 26, 2013

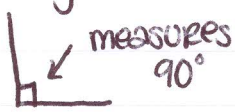
Angles and Addition

I. Types of Angles

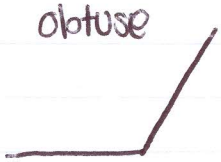
Acute

smaller than 90°

Right



obtuse

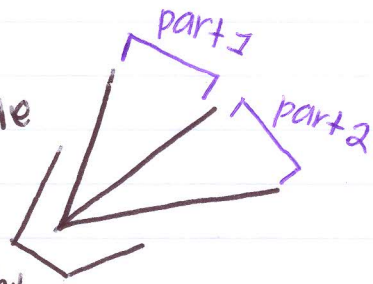


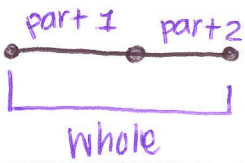
bigger than 90°

exactly 180°

II. Angle Addition

part 1 + part 2 = whole

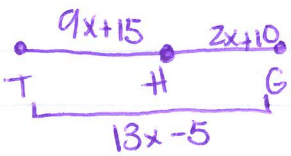




Ex. $m\angle THU$ $(9x+15)$, $m\angle UHG$ $(2x+10)$, $m\angle THG$ $(13x-5)$

$m\angle$ means "degree" like "inches"

think of it like:



$m\angle THU + m\angle UHG = m\angle THG$

$9x+15 + 2x+10 = 13x-5$

$11x + 25 = 13x - 5$

$25 = 2x - 5$

$30 = 2x$

$15 = x$

$m\angle THU = 9(15)+15 = 150$

$m\angle UHG = 2(15)+10 = 30+10 = 40$

$m\angle THG = 13(15)-5 = 195-5$

$= 190$

August 27, 2013

1-3

Segments vs. Angles & their Measures

I. Types of Angles

Acute — less than Right

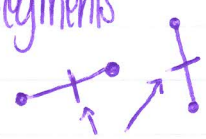
Right — means 90° — Exactly 90°

Obtuse — more than Right, bigger than 90°

Straight — exactly 180°

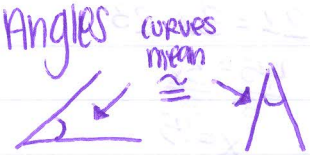
II. Congruence ≅

Segments

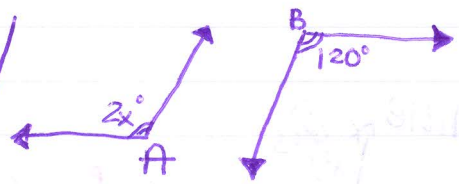


mean ≅ (congruence)

Angles curves mean ≅



Ex/



$\angle A \cong \angle B$

$m\angle A = m\angle B$

$2x = 120°$

$x = 60°$

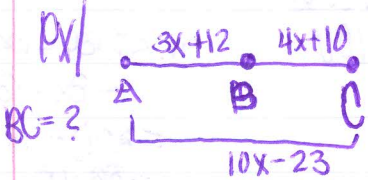
$m\angle A = 120°$

III. Addition

Segment

part 1 + part 2 = whole

Ex/



BC = ?

$AB + BC = AC$

$3x + 12 + 4x + 10 = 10x - 23$

$7x + 22 = 10x - 23$

$22 = 3x - 23$

$45 = 3x$

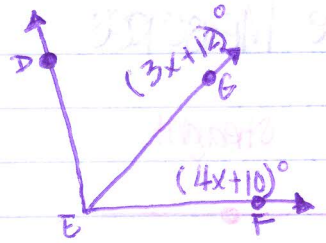
$15 = x$

$BC = 4(15) + 10$

$= 60 + 10$

$= 70$

ex/



$m\angle DEF = (10x-23)^\circ$

$m\angle GEF = ?$

part 1 + part 2 = whole

$m\angle DEG + m\angle GEF = m\angle DEF$

$(3x+12) + (4x+10) = (10x-23)$

same as before

$7x + 22 = 10x - 23$

$22 = 3x - 23$

$\frac{45}{3} = \frac{3x}{3}$

$x = 15$

$m\angle GEF = 4(15) + 10$

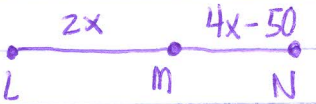
$= 60 + 10$

$= 70^\circ$

IV. Midpoints & Bisectors

part 1 = part 2 OR 2(part) = whole

ex/



$LN = ?$

M is midpoint

$LM = MN$

$2x = 4x - 50$

$-4x \quad -4x$

$-2x = -50$

$x = 25$

$MN = 4(25) - 50$

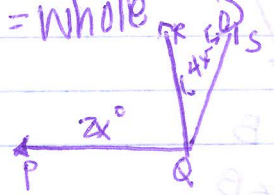
$= 100 - 50$

$= 50$

$LM = 50$

$LN = 100$

ex/



$\overrightarrow{QR}$ bisects $\angle PQS$

$m\angle PQS = ?$

$\angle PQR = m\angle PQS$

$2x = 4x - 50$

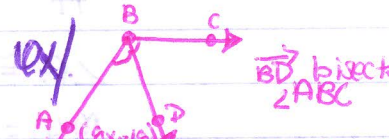
$-2x = -50$

$x = 25$

$m\angle PQS = m\angle PQR + m\angle RQS$

$= 50 + 50 = 100^\circ$

ex/



$\overrightarrow{BD}$ bisect $\angle ABC$

part 1 → $m\angle ABD = (8x-18)$

$m\angle ABC = (10x+30)^\circ$ whole

$m\angle DBC = ?$

2(part) = whole

$2(m\angle ABD) = m\angle ABC$

$2(8x-18) = (10x+30)$

$16x - 36 = 10x + 30$

$6x - 36 = 30$

$6x = 66$

$x = 11$

$m\angle DBC = m\angle ABD$

$= 8x - 18$

$= 8(11) - 18$

$= 88 - 18$

$= 70^\circ$

August 29, 2013

Angle Pairs

Vertical

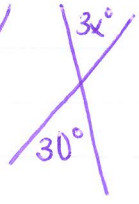
look like:

∠1 & ∠2 are vertical

They're equal!

$m\angle 1 = m\angle 2$

Ex/



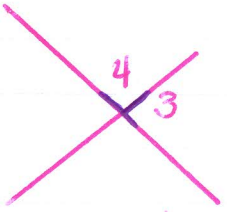
$x = ?$

$3x = 30$

$x = 10$

Linear pair

OR

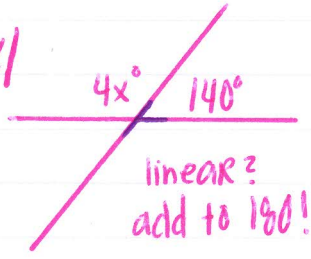


∠1 and ∠2 are linear

∠4 and ∠3 are linear.

add to = 180°!

Ex/



linear? add to 180!

$4x + 140 = 180$

$4x = 40$

$x = 10°$

Complementary Angles

No picture

2 angles + = 90°

Ex/ $m\angle 1 = 40°$ & $m\angle 2 = 50°$

$40 + 50 = 90$

Complementary

Add to 90!

Ex/ ∠3 & ∠4 are complemantery

$m\angle 3 = 10x$ $m\angle 4 = 8x$ $x = ?$

$10x + 8x = 90$

$18x = 90$

$x = 5$

Supplementary

No picture

2 angles + = 180°

(Linear pair is supp.)

Ex/ $m\angle 7 = 102°$ & $m\angle 8 = 78°$

$102 + 78 = 180$

102/78

Supplementary

add = 180!

Ex/ ∠9 & ∠10 are supplementary

$m\angle 9 = 10x$ $m\angle 4 = 8x$ x?

$10x + 8x = 180$

$x = 10$