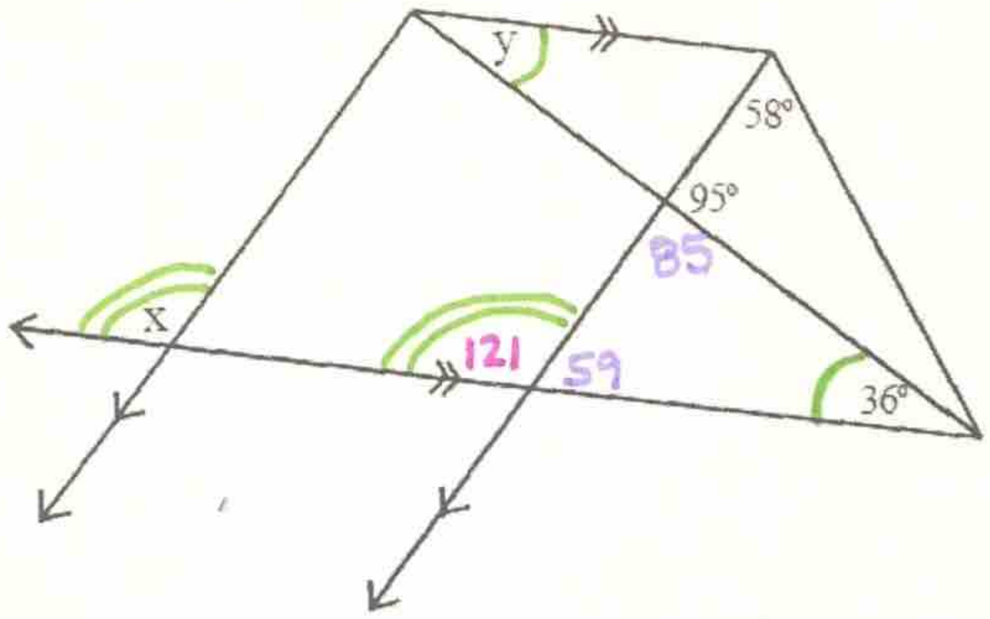
STATION #1:

Geometric Properties

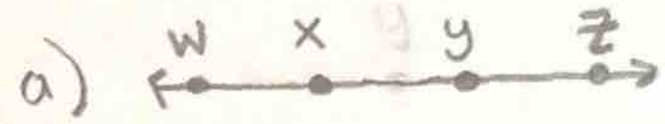
1. Find the values of x and y in the picture.

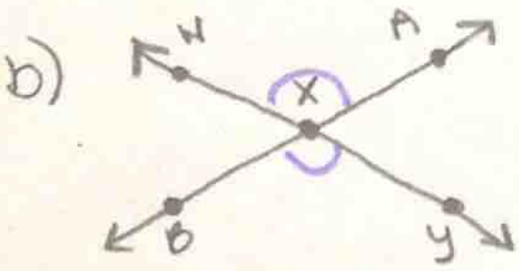
$y = 36°$

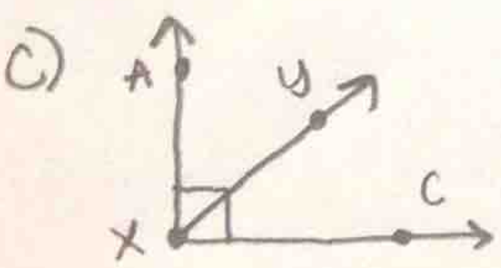
$x = 121°$

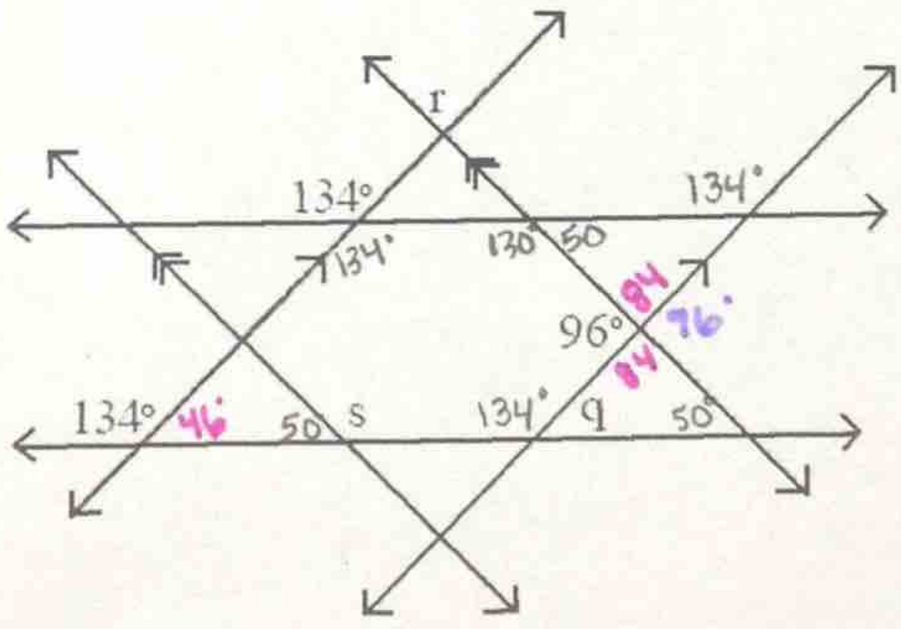


2. Find the values of q, r, and s in the picture.

a) 

b) 

c) 

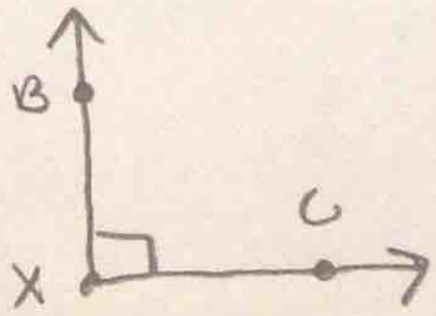


$q = 46°$

$s = 130°$

3. Draw and label a picture to represent the following:

a) Line WZ includes points X and Y so that X is the midpoint of segment WY and Y is the midpoint of XZ.
b) Angles WXA and BXY are obtuse vertical angles.
c) Angles AXY and YXC are complementary.
d) BXC is a right angle.

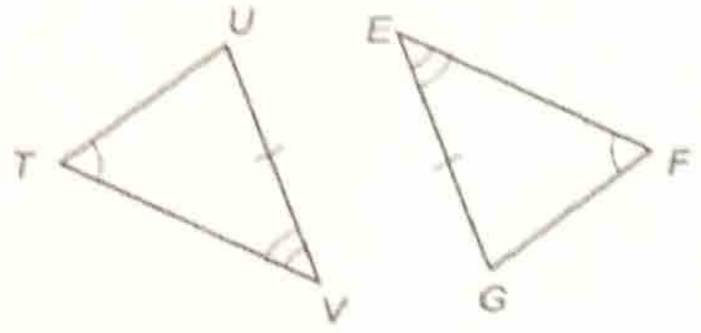


STATION #2:

Triangle Congruence

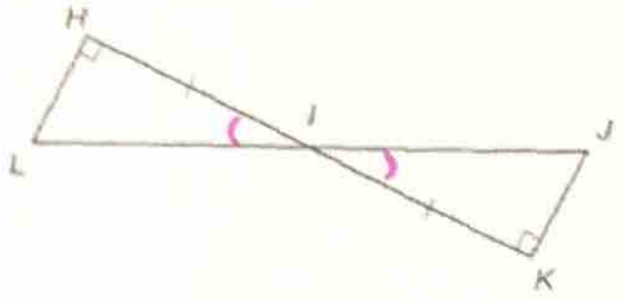
Determine whether each pair of triangles is congruent. If so, write a congruence statement and explain why the triangles are congruent. If it is not possible, write *not possible*.

1.



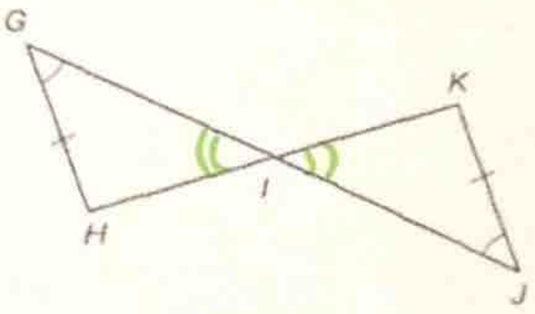
△TVU ≅ △FEC
by AAS ≅

2.



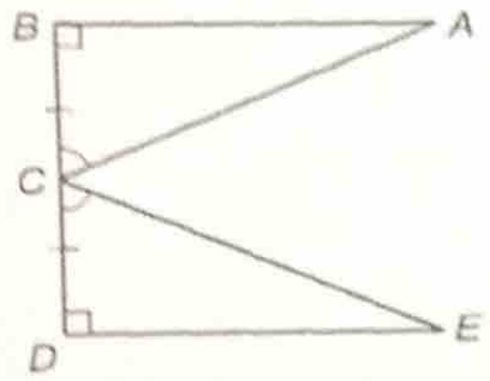
△LHI ≅ △JKI
by ASA ≅

3.



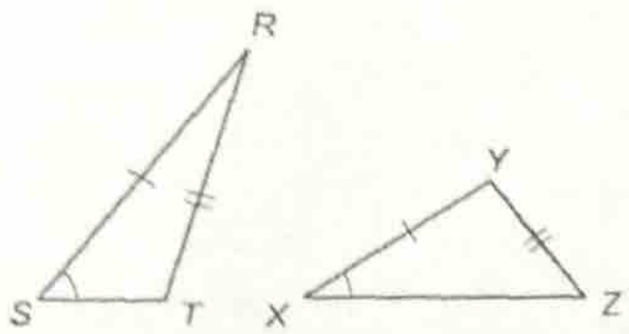
△HGI ≅ △KJI
by AAS ≅

4.



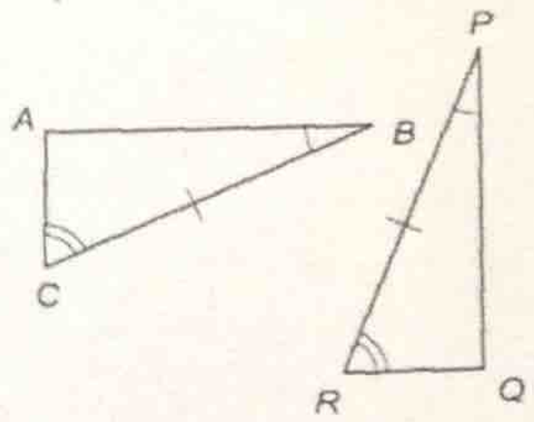
△ABC ≅ △EDC
by ASA ≅

5.



Not possible

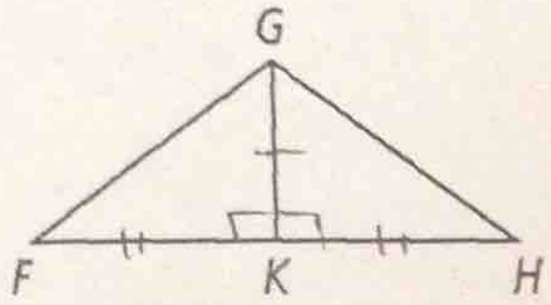
6.



△BCA ≅ △PRQ
by ASA ≅

Write a two column proof.

4. **Given:** $\overline{GK}$ is the perpendicular bisector of $\overline{FH}$.
Prove: $\overline{FG} \cong \overline{HG}$



Statement	Reason
1. $\overline{GK}$ is the perpendicular bisector of $\overline{FH}$.	1. Given
2. $\overline{FK} \cong \overline{KH}$	2. Def. of bisect.
3. ∡FKG and ∡GKH are 90°	3. Def. of ⊥
4. ∡FKG ≅ ∡GKH	4. All right ∡s are ≅
5. $\overline{GK} \cong \overline{GK}$	5. reflexive prop.
6. △FKG ≅ △HKG	6. SAS ≅
7. $\overline{FG} \cong \overline{HG}$	7. CPCTC

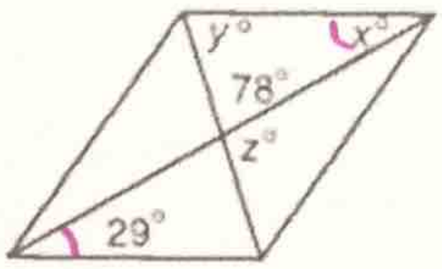
- def. of ⊥
- All right ∡ ≅
- reflexive
- def. of bisect
- SAS ≅
- CPCTC

STATION #3:

Parallelograms

If each quadrilateral is a parallelogram, find the values of x, y, and z.

1.

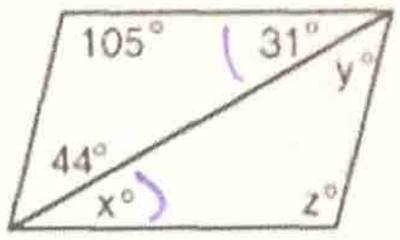


x = 29°

y = 73°

z = 102°

2.

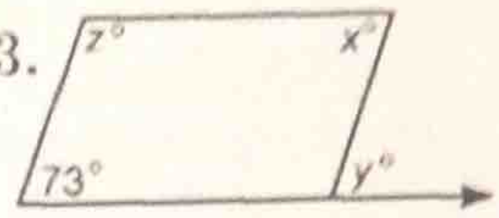


x = 31°

y = 44°

z = 105°

3.

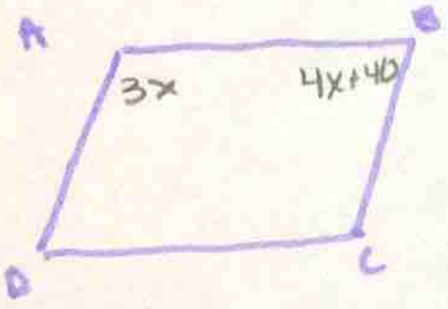


x = 73°

y = 73°

z = 107°

4. In parallelogram $ABCD$, $m\angle A = 3x$ and $m\angle B = 4x + 40$. Find the measure of angles A, B, C, and D.



3x + 4x + 40 = 180

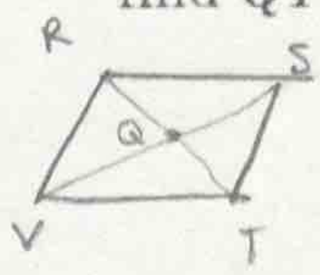
7x = 140

x = 20

∠A = 60° ∠B = 120°

∠C = 60° ∠D = 120°

5. In parallelogram $RSTV$, diagonals $\overline{RT}$ and $\overline{VS}$ intersect at Q. If $RQ = 5x + 1$ and $QT = 3x + 15$, find QT.



5x + 1 = 3x + 15

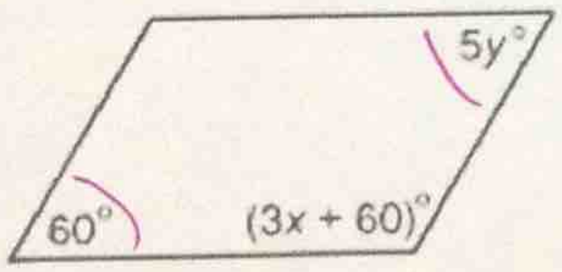
2x = 14

x = 7

QT = 36

Find the values of x and y that ensure each quadrilateral is a parallelogram.

6.



5y = 60

y = 12

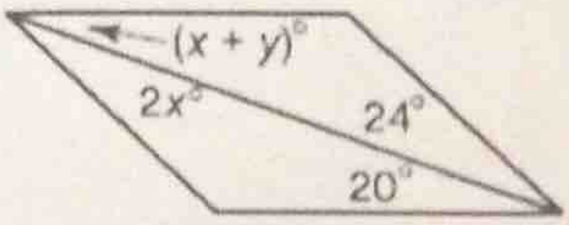
3x + 60 + 60 = 180

3x + 120 = 180

3x = 60

x = 20

7.



2x = 24

x = 12

12 + y = 20

y = 8

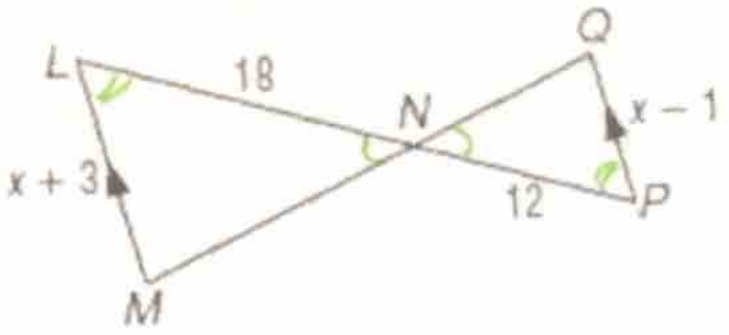
STATION #4:

Similar Polygons

ALGEBRA Identify the similar triangles, and find x and the measures of the indicated sides.

3. $\overline{LM}$ and $\overline{QP}$

$\triangle MLN \sim \triangle QPN$



$\frac{12}{18} = \frac{x-1}{x+3}$

$\overline{LM} = 12$

$\overline{QP} = 8$

$12(x+3) = 18(x-1)$

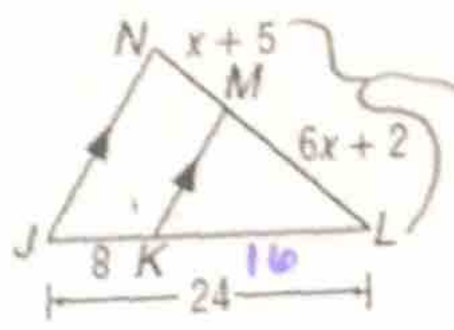
$12x + 36 = 18x - 18$

$54 = 6x$

$x = 9$

4. $\overline{NL}$ and $\overline{ML}$

$\triangle NLJ \sim \triangle MLK$



Total length: $7x + 7$

$\frac{16}{24} = \frac{6x+2}{7x+7}$

$16(7x+7) = 24(6x+2)$

$112x + 112 = 144x + 48$

$64 = 32x$

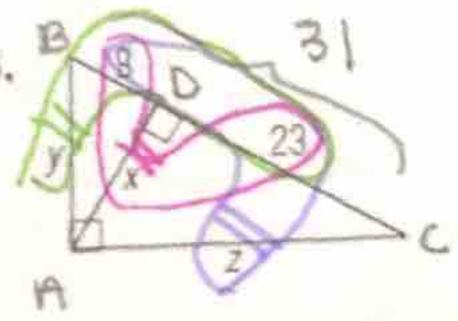
$x = 2$

$\overline{NL} = 21$

$\overline{ML} = 14$

Find x, y, and z.

6.



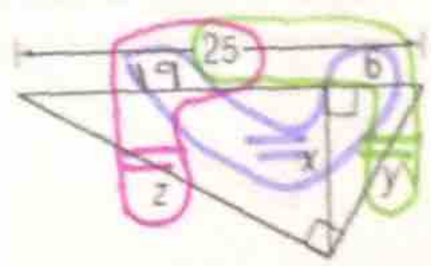
$\triangle ABC \sim \triangle DAC \sim \triangle DBA$

$\frac{8}{x} = \frac{x}{23}$ $\quad x^2 = 184$ $\quad x = 2\sqrt{46}$

$\frac{y}{8} = \frac{31}{y}$ $\quad y^2 = 248$ $\quad y = 2\sqrt{62}$

$\frac{z}{23} = \frac{31}{z}$ $\quad z^2 = 713$ $\quad z = \sqrt{713}$

7.



$\frac{19}{x} = \frac{x}{6}$ $\quad x^2 = 114$ $\quad x = \sqrt{114}$

$\frac{y}{6} = \frac{25}{y}$ $\quad y^2 = 150$ $\quad y = 5\sqrt{6}$

$\frac{z}{19} = \frac{25}{z}$ $\quad z^2 = 475$ $\quad z = 5\sqrt{19}$

STATION #5:

Parallel Lines and Transversals

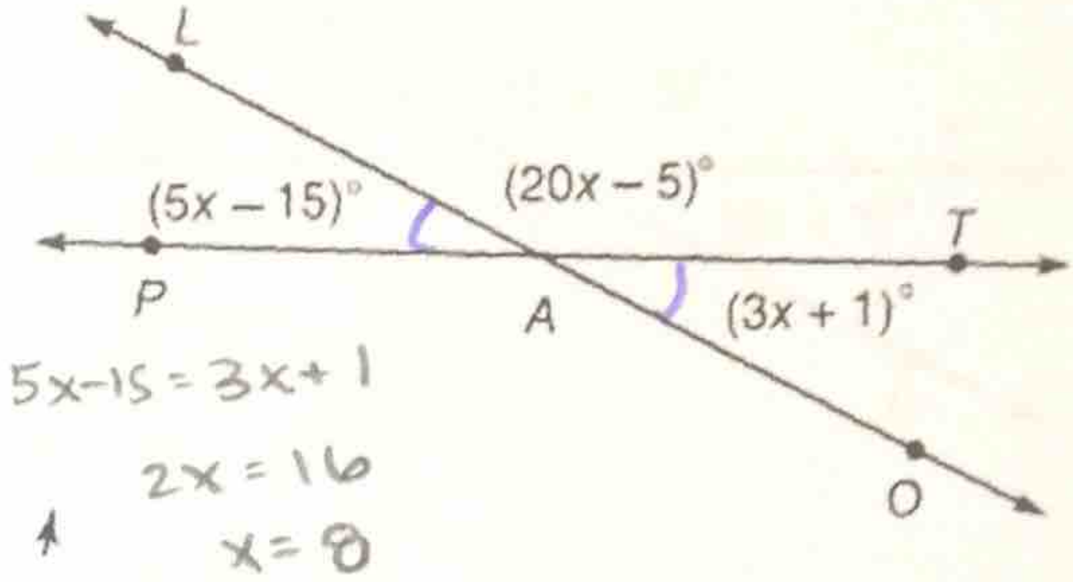
1. Use the figure to find:

   a. x = 8

   b. m∠LAT = 25°

   c. m∠TAO = 25°

   d. m∠PAO = 155°

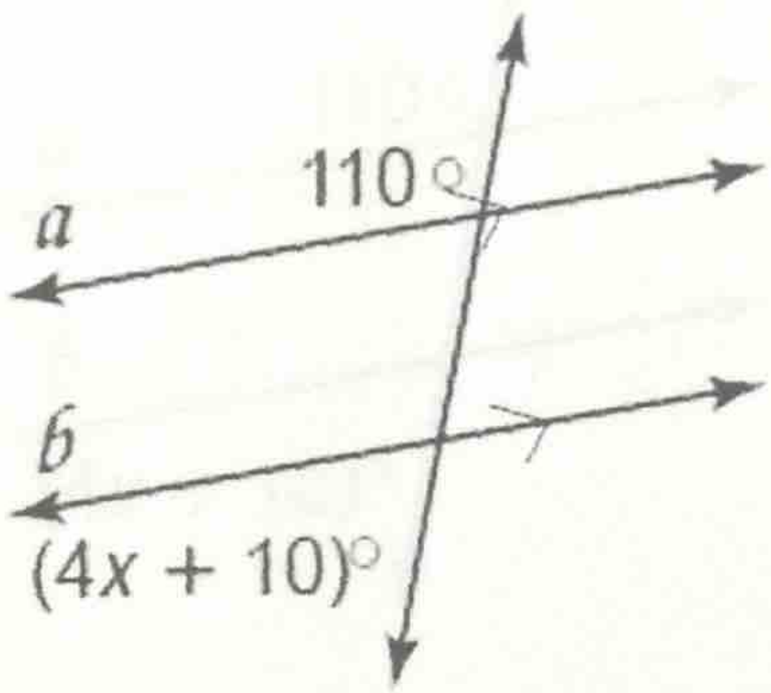


5x-15 = 3x+1

2x = 16

x = 8

2. Find x.



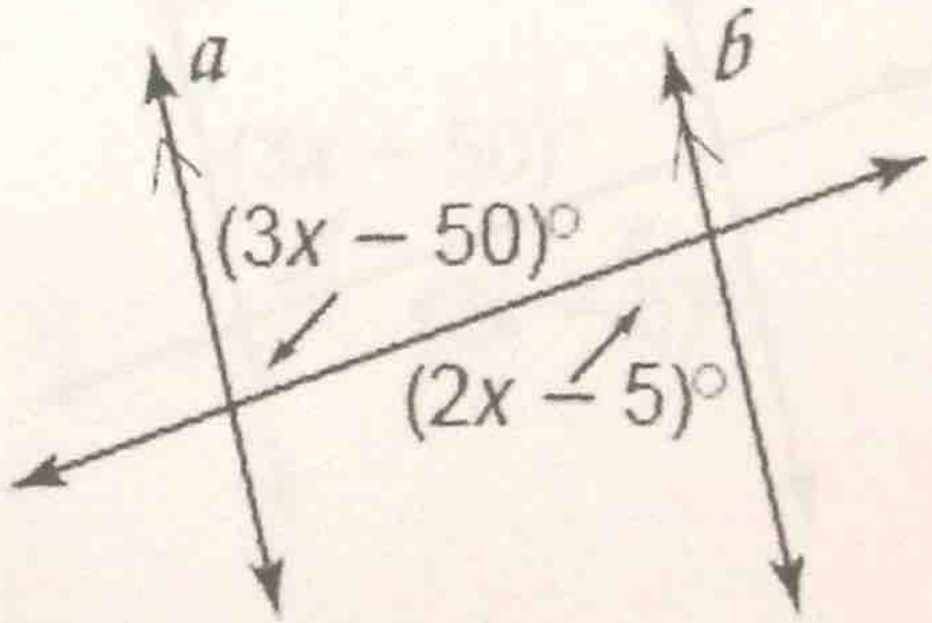
4x + 10 + 110 = 180

4x + 120 = 180

4x = 60

x = 15

3. Find x.



3x - 50 = 2x - 5

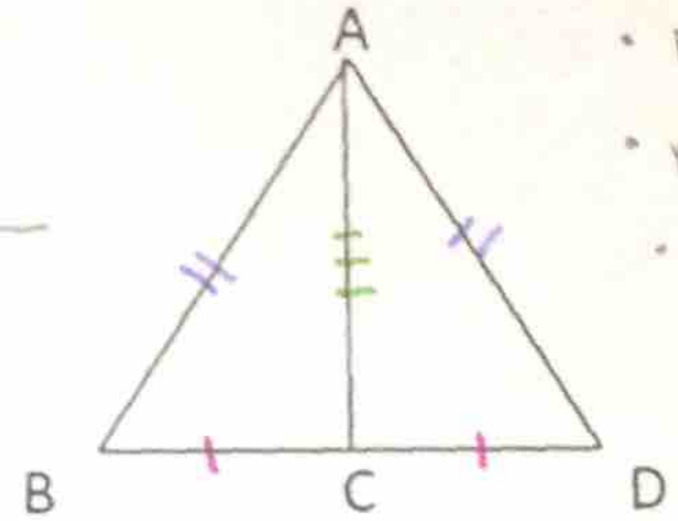
x = 45

STATION #6:

Proofs

1. Given: C is the midpoint of BD, AB ≅ AD

Prove:
$\Delta ABC \cong \Delta ADC$

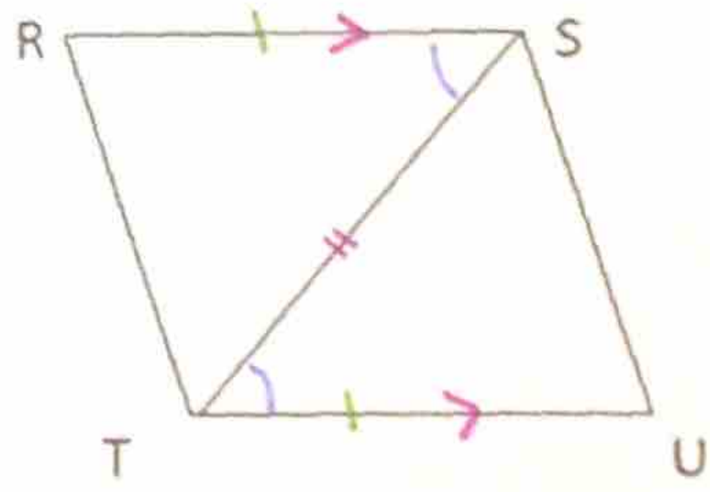


- Def. of midpoint
- reflexive
- SSS ≅

Statement	Reason
1. C is the midpoint of BD, AB ≅ AD	1. Given
2. $\overline{BC} \cong \overline{CD}$	2. Def. of midpoint
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive
4. $\Delta ABC \cong \Delta ADC$	4. SSS ≅

2. Given: RS || TU , RS ≅ TU

Prove:
$\Delta RST \cong \Delta UTS$



- Alt. int. ∠s
- reflexive

Statement	Reason
1. RS // TU, RS ≅ TU	1. Given
2. ∠RST ≅ ∠UTS	2. Alt. int. ∠s ≅
3. $\overline{ST} \cong \overline{ST}$	3 Reflexive
4. $\Delta RST \cong \Delta UTS$	4 SAS ≅