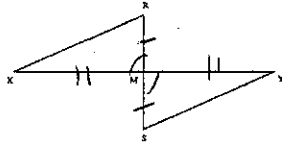


### Station #2 - Triangle Proofs (Part 1)

Key

1) Given: M is the midpoint of  $\overline{RS}$   
M is the midpoint of  $\overline{XY}$

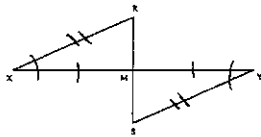
Prove:  $\triangle RMX \cong \triangle SMY$



Statement	Reason
1. M is midpt of $\overline{RS}$	1. Given
2. $RM \cong SM$	2. Definition of Midpoint
3. M is midpt of $\overline{XY}$	3. Given
4. $XM \cong YM$	4. Definition of Midpoint
5. $\angle RMX \cong \angle SMY$	5. Vertical Angles
6. $\triangle RMX \cong \triangle SMY$	6. SAS Triangle Congruence Shortcut

2) Given:  $\overline{XR} \parallel \overline{SY}$   
 $\overline{RS}$  bisects  $\overline{XY}$   
 $\overline{RX} \cong \overline{SY}$

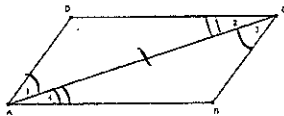
Prove:  $\triangle RMX \cong \triangle SMY$



Statement	Reason
1. $\overline{XR} \parallel \overline{SY}$	1. Given
2. $\overline{RS}$ bisects $\overline{XY}$	2. Given
3. $\overline{RX} \cong \overline{SY}$	3. Given
4. $XM \cong YM$	4. Definition of Bisector
5. $\angle XRM \cong \angle SYM$	5. Alternate Interior Angles
6. $\triangle RMX \cong \triangle SMY$	6. SAS Triangle Congruence Shortcut

3) Given:  $\overline{DC} \parallel \overline{AB}$   
 $\overline{AD} \parallel \overline{BC}$

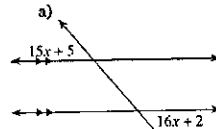
Prove:  $\triangle ABC \cong \triangle CDA$



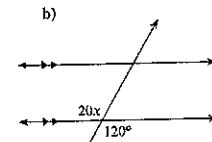
Statement	Reason
1. $\overline{DC} \parallel \overline{AB}$	1. given
2. $\overline{AD} \parallel \overline{BC}$	2. given
3. $\angle 1 \cong \angle 3$	3. alt. interior
4. $\angle 2 \cong \angle 4$	4. alt. interior
5. $\overline{AC} \cong \overline{AC}$	5. reflexive
6. $\triangle ABC \cong \triangle CDA$	6. ASA

### Station #1 - Parallel and Transversal Lines

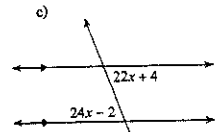
1) Name the relationship between the measured angle, then find x:



alternate exterior  
 $x = 3$

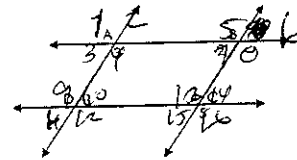


vertical angles  
 $x = 6$



alternate interior  
 $x = 3$

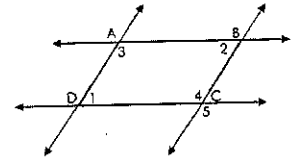
2) Given:  $\overline{AB} \parallel \overline{DC}$ ,  $\overline{AD} \parallel \overline{BC}$   
Prove:  $\angle 10 \cong \angle 7$



- ①  $AB \parallel DC$  &  $AD \parallel BC$
- ②  $\angle 10 \cong \angle 2$
- ③  $\angle 2 \cong \angle 6$
- ④  $\angle 6 \cong \angle 7$
- ⑤  $\angle 10 \cong \angle 7$

- ① given
- ② corresp.
- ③ corresp.
- ④ vertical angle
- ⑤ transitive

3) Given:  $\overline{AB} \parallel \overline{DC}$ ,  $\overline{AD} \parallel \overline{BC}$   
Prove:  $\angle 4 \cong \angle 11$



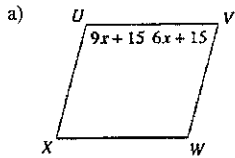
- ①  $AB \parallel DC$  &  $AD \parallel BC$
- ②  $\angle 4 \cong \angle 10$
- ③  $\angle 10 \cong \angle 6$
- ④  $\angle 4 \cong \angle 6$
- ⑤ given

\* Answers may vary

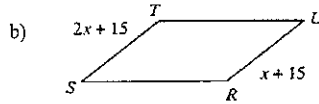
### Station #4 - Parallelogram Proofs

Key

1) Solve for x:

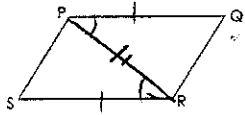


$x = 10$



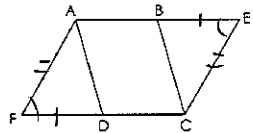
$x = 0$

2) Given:  $\overline{PQ} \parallel \overline{SR}$ ;  $\overline{PQ} \cong \overline{SR}$   
Prove:  $\overline{PS} \cong \overline{QR}$



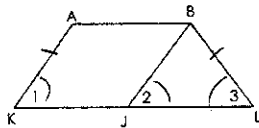
- ①  $\overline{PQ} \parallel \overline{SR}$  &  $\overline{PQ} \cong \overline{SR}$  ① given
- ②  $\overline{PR} \cong \overline{PR}$  ② reflexive
- ③  $\angle QPR \cong \angle SRP$  ③ alt. interior angles
- ④  $\triangle QPR \cong \triangle SRP$  ④ SAS
- ⑤  $\overline{PS} \cong \overline{QR}$  ⑤ CPCTC

3) Given:  $AECF$  is a parallelogram;  
 $\overline{FD} \cong \overline{BE}$   
Prove:  $\overline{AD} \cong \overline{BC}$



- ①  $AECF$  is  $\square$  &  $\overline{FD} \cong \overline{BE}$  ① given
- ②  $\overline{AF} \cong \overline{CE}$  ② opp. sides are congruent
- ③  $\angle F \cong \angle E$  ③ opp. angles are congruent
- ④  $\triangle AFD \cong \triangle CEB$  ④ SAS
- ⑤  $\overline{AD} \cong \overline{BC}$  ⑤ CPCTC

4) Given:  $\angle 1 \cong \angle 2$ ,  $\angle 2 \cong \angle 3$ ,  
 $\overline{AK} \cong \overline{BL}$   
Prove:  $ABJK$  is a parallelogram



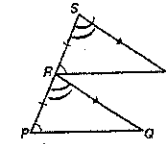
- ①  $\angle 1 \cong \angle 2$ ,  $\angle 2 \cong \angle 3$ ,  $\overline{AK} \cong \overline{BL}$  ① given
- ②  $\triangle JBL \cong \triangle JBL$  ② AAS
- ③  $\overline{BJ} \cong \overline{BJ}$  ③ CPCTC
- ④  $ABJK$  is  $\square$  ④ opp. sides are congruent

### Station #3 - Triangle Proofs (Part 2)

Key

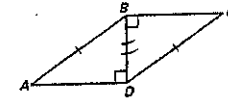
1) Complete each proof.

Given:  $\overline{ST} \parallel \overline{RQ}$ ,  $\overline{SR} \cong \overline{RP}$ ,  $\angle SRT \cong \angle RPQ$   
Prove:  $\overline{RT} \cong \overline{PQ}$



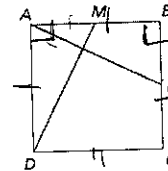
Statements	Reasons
1. $\overline{ST} \parallel \overline{RQ}$ , $\overline{SR} \cong \overline{RP}$	1. Given
2. $\angle RST \cong \angle RPQ$	2. corresponding angles
3. $\triangle RST \cong \triangle RPQ$	3. ASA
4. $\overline{RT} \cong \overline{PQ}$	4. CPCTC

2) Given:  $\overline{AB} \cong \overline{CD}$ ,  $\angle ADB$  and  $\angle DCB$  are right angles  
Prove:  $\angle ABD \cong \angle CDB$



Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$ & $\angle ADB \cong \angle DCB$	1. given
2. $\overline{DB} \cong \overline{DB}$	2. Reflexive
3. $\triangle ABD \cong \triangle CDB$	3. HL
4. $\angle ABD \cong \angle CDB$	4. CPCTC

3) In the figure at the right,  $ABCD$  is a square. Points  $M$  and  $N$  are the midpoints of  $\overline{AB}$  and  $\overline{BC}$ , respectively.  
a. The flowchart below outlines a proof that shows  $\overline{AN} \cong \overline{DM}$ . Copy and complete the flowchart.



Flowchart:

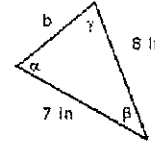
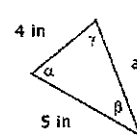
- 1.  $ABCD$  is a square.
- 2.  $\overline{AM} \cong \overline{BN}$  (def. of midpoint)
- 3.  $\overline{AN} \cong \overline{DM}$  (CPCTC)

②  $\overline{AD} \cong \overline{BC}$  all sides of squares are congruent  
③  $\angle A \cong \angle B$  def. of perpendicular

Station #5 – Similar Triangles

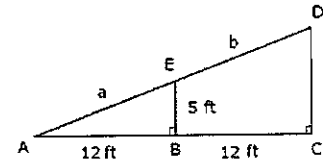
key

1) Find a and b for the two similar triangles:



$b = 5.6$   
 $a = 11.2$

2) Consider the picture shown below:



a) Use the Pythagorean Theorem to find the value of a.

$12^2 + 5^2 = a^2$        $a = 13$

b) Prove that the triangles ABE and ACD are similar.

- ①  $\angle A \cong \angle A$  | reflexive
- ②  $\angle ABE \cong \angle ACD$  | def of perpendicular
- ③  $\triangle ABE \sim \triangle ACD$  | AA

c) Use similar triangles to find the value of x.

$x = 10$

d) Find the value of b

$b = 13$

3) A person is standing 40 ft away from a street light that is 30 ft tall. How tall is he if his shadow is 10 ft long?

7.5 ft

4) Find x, y and h (hint, use Pythagorean Theorem):

$x = 13.8$   
 $y = 15.2$   
 $h = 14.5$

