Congruence Unit Review: Practice Assessment   *Solutions*   N.M.
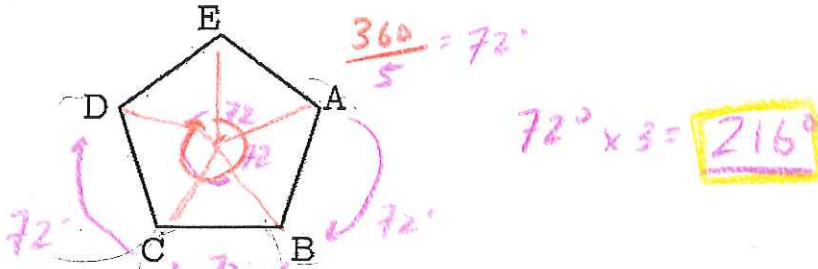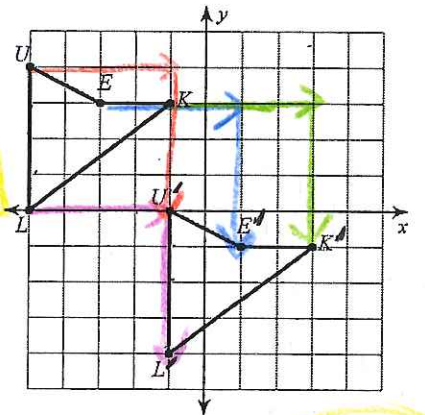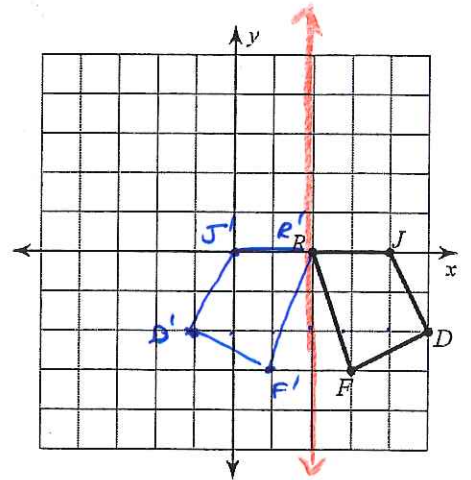
Congruence 1: Transformations:

1. Draw and label the figure after a reflection across the vertical line x=2.

2. Describe the term line segment in terms of points, lines, and planes.

   Part of a line including and between 2 endpoints.

3. How many degrees of clockwise rotation would it take for A to be carried onto D?

   $\frac{360}{5} = 72°$

   $72° \times 3 = \boxed{216°}$

4. Use arrow notation to write a rule that will carry LUEK to L'U'E'K'.

   $L: (-5, 0) \rightarrow L'(-1, -4)$ →4 ↓4

   $U: (-5, 4) \rightarrow U'(-1, 0)$ →4 ↓4
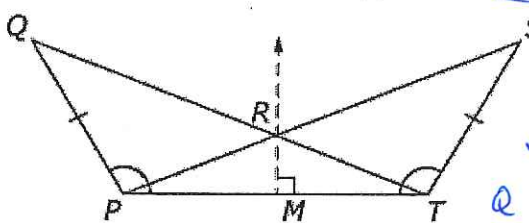
   $\boxed{(x,y) \rightarrow (x+4, y-4)}$

Congruence 2: Triangle Congruence

5. In each pair, are the triangles congruent? If so, what criteria is shown?

   yes, by AAS   AAS   vertical angles

   Not enough info   AS   Not a "shortcut"

   yes, by HL   reflexive property
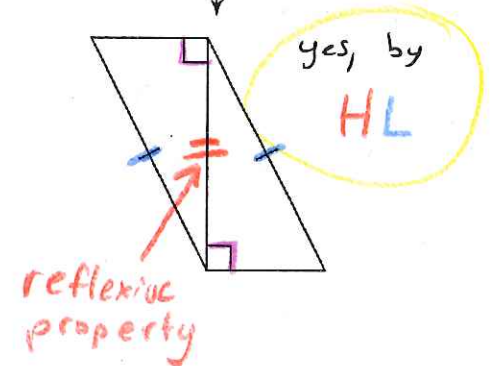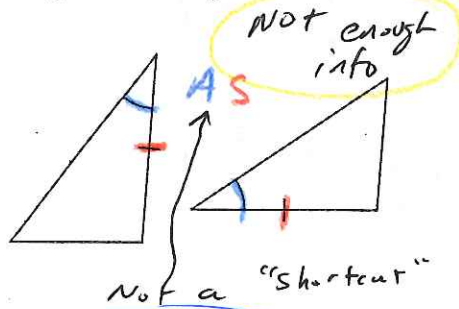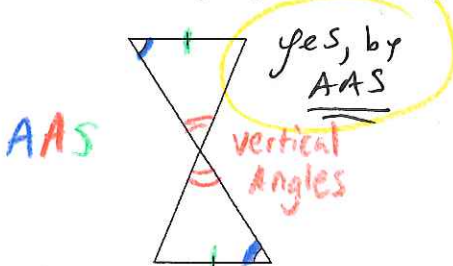
6. Which transformation(s) would show $\triangle QTP \cong \triangle SPT$?
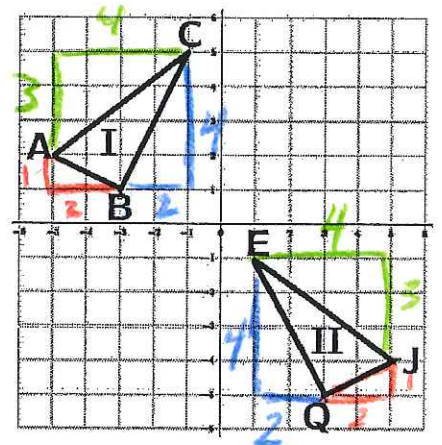
   [ ] horizontal translation along the length PR   *Nope.*
   [ ] horizontal translation along the length of PT
   [✓] reflection over RM
   [ ] reflection over SP

   Q needs to "travel" to S
   T needs to "travel" to P
   P needs to "travel" to T

7. Figure 1 goes through rigid transformations to become Figure 2. What segment is congruent to CA?

   $\overline{AB} \cong \overline{JQ}$

   $\boxed{\overline{CA} \cong \overline{EJ}}$

   $\overline{CB} \cong \overline{EQ}$

Congruence 3: Parallel Lines and Triangles

8. Name a pair of corresponding angles.

∠1 ≅ ∠5   or ∠2 ≅ ∠6   or ∠3 ≅ ∠7   or ∠4 ≅ ∠8

9. Name a pair of alternate interior angles.

∠4 and ∠5   or   ∠3 and ∠6

10. If ∠3 = 14x + 45 and ∠5 = 7x + 30, what is the value of x?

$x = 5$

Same-side Interior → makes 180°   ∠3 + ∠5 = 180°

$14x + 45 + 7x + 30 = 180$
$21x + 75 = 180$
$-75 \quad -75$ ⟹ $\dfrac{21x}{21} = \dfrac{105}{21}$
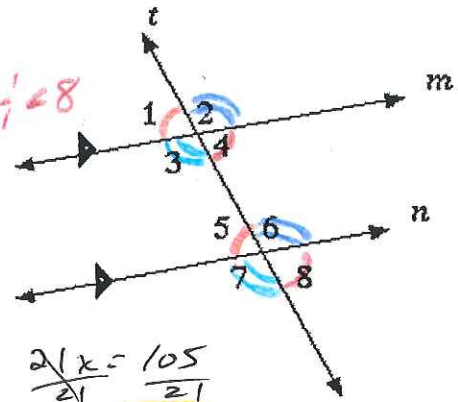
$x = 5$

11. Complete the proof.

Given: $m \parallel n$
Prove: $\angle 3 \cong \angle 6$

Statements	Reasons
1. $m \parallel n$	1. Given
2. $\angle 3 \cong \angle 7$	2. Corresponding Angles
3. $\angle 7 \cong \angle 6$	3. Vertical Angles
4. $\angle 3 \cong \angle 6$	4. TRANSITIVE PROPERTY

Review!
If $A \cong B$, and $B \cong C$, then:
$A \cong C$

12. Find the length of RS.

5

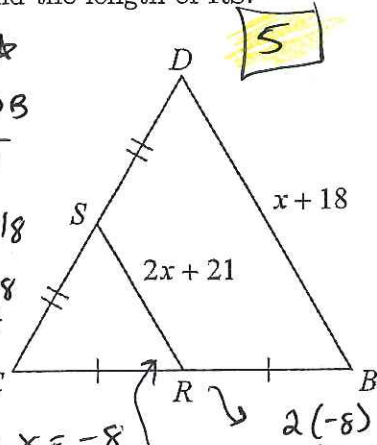midsegment ★

$\overline{SR} = \frac{1}{2} \cdot \overline{DB}$
⟹ $2 \cdot \overline{SR} = \overline{DB}$

$2(2x + 21) = x + 18$
$4x + 42 = x + 18$
$-x - 42 \quad -x - 42$

$\dfrac{3x}{3} = \dfrac{-24}{3}$ → $x = -8$

$2(-8) + 21$
$-16 + 21$
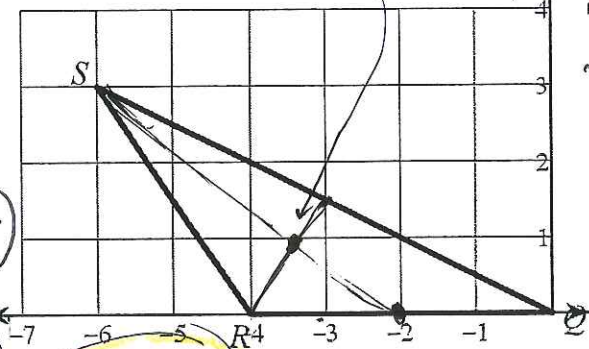$= 5$

Congruence 4: Quadrilaterals

13. Find the coordinates of the centroid.

Review: where medians intersect. "Average" of 3 pts.

S: (-6, 3)
R: (-4, 0)
Q: (0, 0)

C:
$\left(\dfrac{-6 + -4 + 0}{3}, \dfrac{3 + 0 + 0}{3} \right)$

$\left(\dfrac{-10}{3}, \dfrac{3}{3} \right)$

$\left(-\dfrac{10}{3}, 1 \right)$

14. Consider rhombus DCBA with diagonals intersecting at E.

Find the angle measures

∠1 = 35°   ∠2 = 90   ∠3 = 55   see ∠2

∠4 = 55   ∠ABC = 110°

∠3
$180° - 90 - 35$
$= 55$
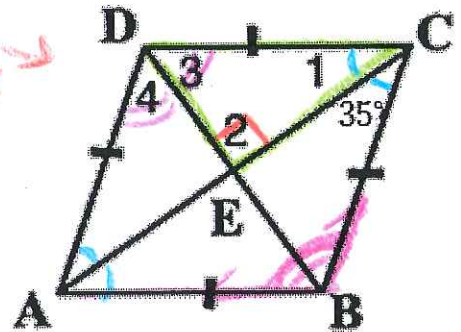
15. ABCD is a parallelogram. If BE = 11x - 15, and BD = 8x + 12, find the length of DE.

18

diagonals bisect each other

BD ≠ BE ← careful!

BD = 2 · BE

$8x + 12 = 2(11x - 15)$

$8x + 12 = 22x - 30$
$-8x \quad +30 \quad -8x \quad +30$

$\dfrac{42}{14} = \dfrac{14x}{14}$

$3 = x$

BE = DE = 11(3) - 15 = 33 - 15

$= 18$