

**Math 096 - Test 2**  
March 22, 2017

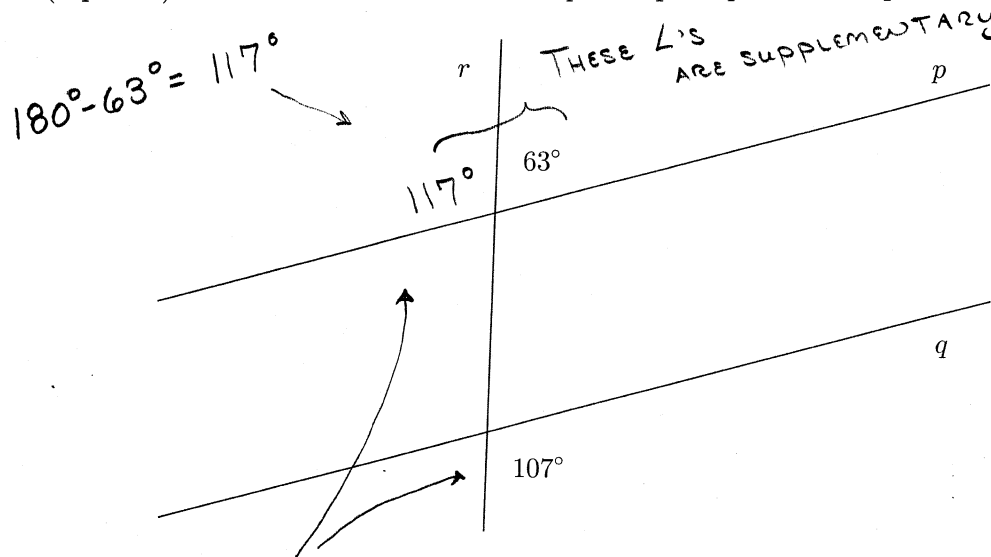
Name key Score \_\_\_\_\_

Show all work. Supply explanations when necessary. Partial credit will be awarded for correct work.

- (2 points) How many congruent sides does a scalene triangle have? 0
- (2 points) What is the name of a polygon with 7 sides? HEPTAGON
- (5 points) Find the measure of each interior angle of a regular nonagon.

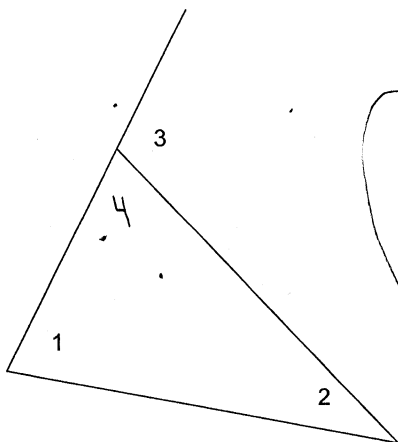
$$\frac{180^\circ(9-2)}{9} = 140^\circ$$

- (4 points) Determine whether the lines  $p$  and  $q$  are parallel. Explain how you know.



ALTERNATE EXTERIOR  $\angle$ 'S ARE  
NOT CONGRUENT  $\Rightarrow$  LINES ARE NOT PARALLEL.

5. (6 points) Give a brief but convincing argument that  $m(\angle 1) + m(\angle 2) = m(\angle 3)$ .



$$m(\angle 1) + m(\angle 2) + m(\angle 4) = 180^\circ$$

$$m(\angle 3) + m(\angle 4) = 180^\circ$$

$$m(\angle 3) = 180^\circ - m(\angle 4)$$

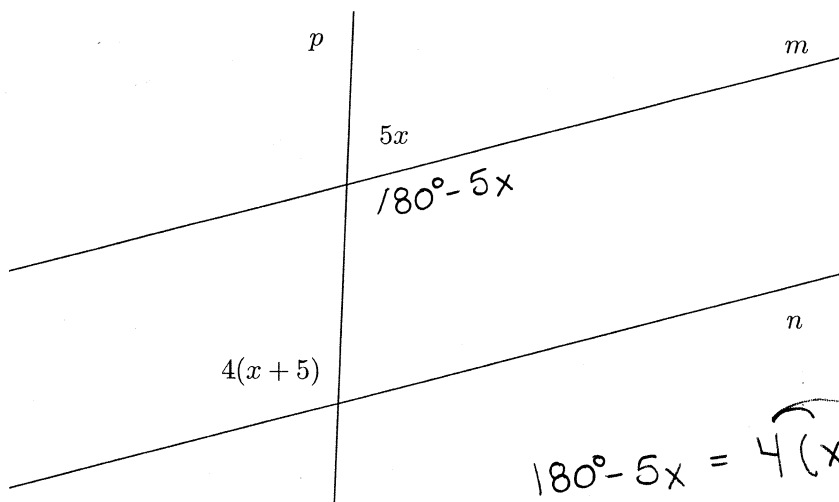
SAME!

$$m(\angle 1) + m(\angle 2) = 180^\circ - m(\angle 4)$$



$$m(\angle 3) = m(\angle 1) + m(\angle 2)$$

6. (6 points) Find the value of  $x$  so that the lines  $m$  and  $n$  are parallel.



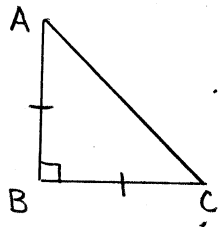
$$180^\circ - 5x = 4(x + 5)$$

$$180^\circ - 5x = 4x + 20$$

$$160^\circ = 9x$$

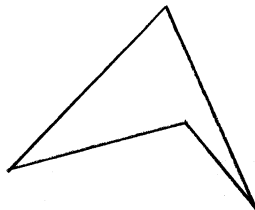
$$x = \frac{160^\circ}{9} = 17.\bar{7}^\circ$$

7. (3 points) In  $\triangle ABC$ ,  $AB = 5$  cm,  $BC = 5$  cm, and  $m(\angle B) = 90^\circ$ . Completely describe the type of triangle represented by  $\triangle ABC$ . (In other words, give the complete name for the triangle.)



$\triangle ABC$  IS AN ISOSCELES RIGHT TRIANGLE

8. (2 points) Sketch a concave quadrilateral. (Use a straight-edge.)



9. (3 points) Find the number of sides of a polygon whose interior angles have measures that add up to  $4140^\circ$ .

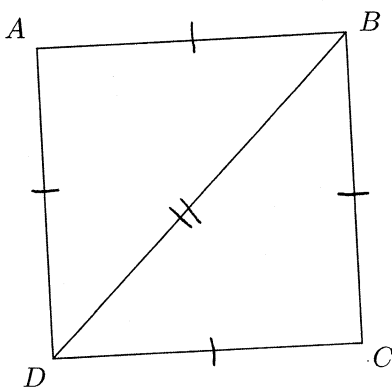
$$180^\circ(n-2) = 4140^\circ$$

$$n-2 = 23 \Rightarrow$$

$$n = 25$$

25 SIDES

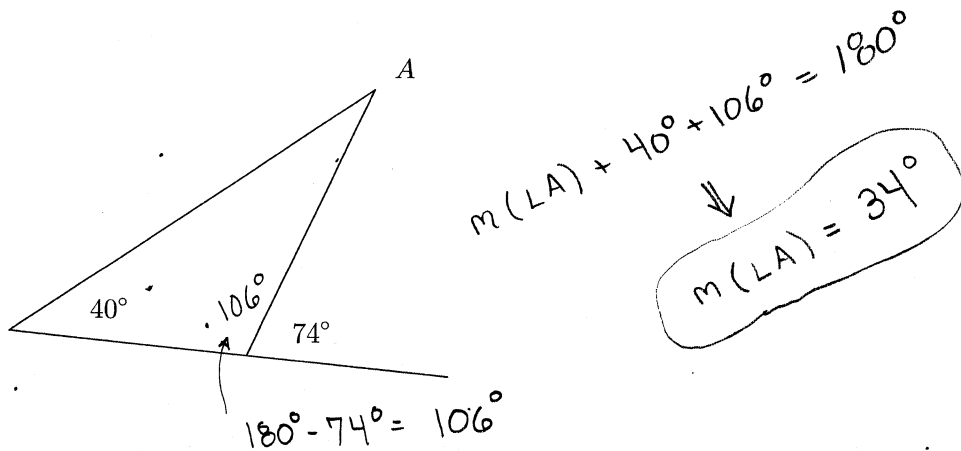
10. (8 points) The figure  $ABCD$  shown below is a regular quadrilateral (i.e., a square) with one of its diagonals drawn. Find two congruent triangles, give a correct congruence statement, and explain how you know your triangles are congruent.



$$\triangle ABD \cong \triangle CDB$$

Congruent by SSS property.

11. (4 points) Find the measure of the interior angle at A. Show work or explain.



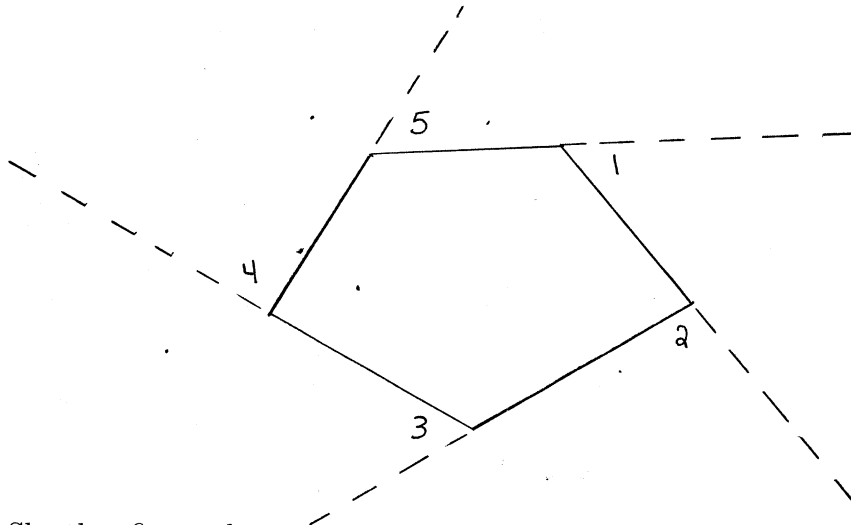
12. (2 points) What does CPCTC stand for? (Circle a single answer.)

- (a) Corresponding parts of corresponding triangles are corresponding.
- (b) Congruent parts of corresponding triangles are corresponding.
- (c) Corresponding parts of congruent triangles are congruent.
- (d) Congruent parts of corresponding triangles are correct.
- (e) Can police cars topple cones.

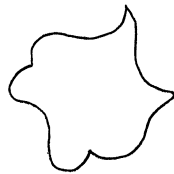
13. (2 points) What is the sum of the measures of the exterior angles a convex polygon with 117 sides?

360° For ANY CONVEX POLY!

14. (6 points) Use a straight-edge to sketch a convex pentagon. Then shown and label the exterior angles.



15. (3 points) Sketch a figure that is not a polygon and explain why exactly it is not.



THIS IS NOT A POLYGON  
BECAUSE IT IS NOT  
MADE OF LINE SEGMENTS.

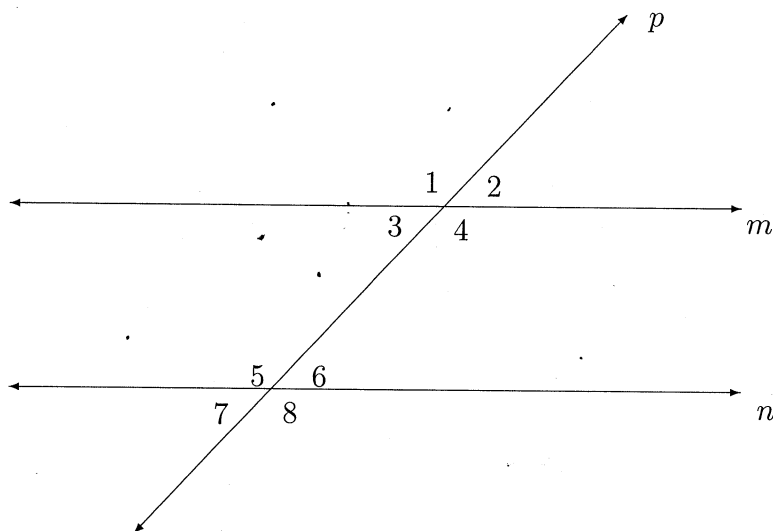
16. (2 points) In the SSS triangle congruence property, what does SSS stand for?

SIDE - SIDE - SIDE

17. (5 points) Two lines are cut by a transversal. Which of these would prove that the lines are parallel. Circle all that apply.

- (a) A pair of vertical angles are congruent.
- (b) A pair of corresponding angles are congruent.
- (c) A pair of adjacent angles are congruent.
- (d) A pair of alternate interior angles are congruent.
- (e) A pair of alternate exterior angles are congruent.

18. (12 points) In the following figure, the parallel lines  $m$  and  $n$  are being cut by transversal  $p$ .



- (a) Name a pair of alternate exterior angles.

$$\angle 1 \text{ \& } \angle 8 \quad \text{-or-} \quad \angle 2 \text{ \& } \angle 7$$

- (b) Name a pair of corresponding angles.

$$\angle 1 \text{ \& } \angle 5 \quad \text{-or-} \quad \angle 2 \text{ \& } \angle 6 \quad \text{-or-} \quad \angle 3 \text{ \& } \angle 7$$

$$\text{-or-} \quad \angle 4 \text{ \& } \angle 8$$

- (c) Name a pair of alternate interior angles.

$$\angle 3 \text{ \& } \angle 6 \quad \text{-or-} \quad \angle 4 \text{ \& } \angle 5$$

- (d) Name a pair of vertical angles.

$$\angle 1 \text{ \& } \angle 4 \quad \text{-or-} \quad \angle 2 \text{ \& } \angle 3 \quad \text{-or-} \quad \angle 5 \text{ \& } \angle 8$$

$$\text{-or-} \quad \angle 6 \text{ \& } \angle 7$$

- (e) Name a pair of adjacent angles.

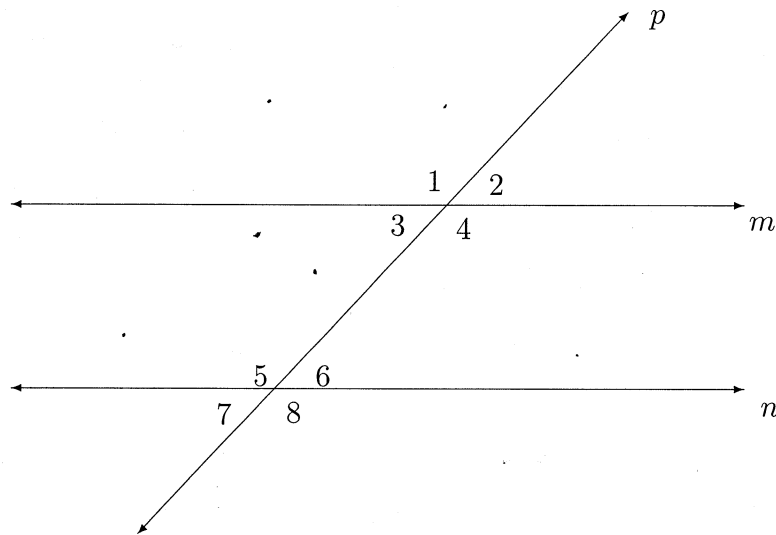
$$\angle 1 \text{ \& } \angle 2 \quad \text{-or-} \quad \angle 2 \text{ \& } \angle 4 \quad \text{-or-} \dots$$

- (f) Name a pair of supplementary angles that are not adjacent.

$$\angle 1 \text{ \& } \angle 6 \quad \text{-or-} \quad \angle 2 \text{ \& } \angle 8 \quad \text{-or-} \quad \angle 4 \text{ \& } \angle 7$$

$$\text{-or-} \quad \angle 3 \text{ \& } \angle 5$$

19. (8 points) In the following figure, the parallel lines  $m$  and  $n$  are being cut by transversal  $p$ .



- (a) Find  $m(\angle 7)$  if  $m(\angle 1) = 108^\circ = m(\angle 5)$

$$\Rightarrow m(\angle 7) = 72^\circ$$

- (b) Find  $m(\angle 5)$  if  $m(\angle 4) = 110.8^\circ$ .

$$m(\angle 5) = m(\angle 4) = 110.8^\circ$$

- (c) Find  $m(\angle 5)$  if  $m(\angle 3) = 71^\circ$ .

$$m(\angle 4) = 109^\circ = m(\angle 5)$$

- (d) Find  $m(\angle 6)$  if  $m(\angle 7) = 68^\circ$ .

$$m(\angle 6) = 68^\circ$$

20. (2 points) What is the difference between an equilateral triangle and an equiangular triangle?

EQUILATERAL  $\Delta$ 'S HAVE 3 CONGRUENT SIDES.

EQUIANGULAR  $\Delta$ 'S HAVE 3 CONGRUENT INTERIOR  $\angle$ 'S.

BUT ACTUALLY  
THEY ARE  
SAME.

21. (8 points) Suppose  $\triangle ABC \cong \triangle LGS$ . If  $\angle G$  is a right angle and  $m(\angle A) = 30^\circ$ , find each of the following.

(a)  $m(\angle B)$

$90^\circ$

(b)  $m(\angle C)$

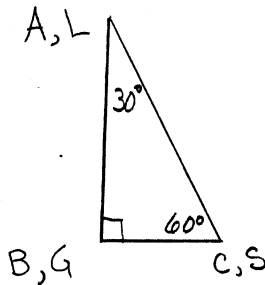
$60^\circ$

(c)  $m(\angle L)$

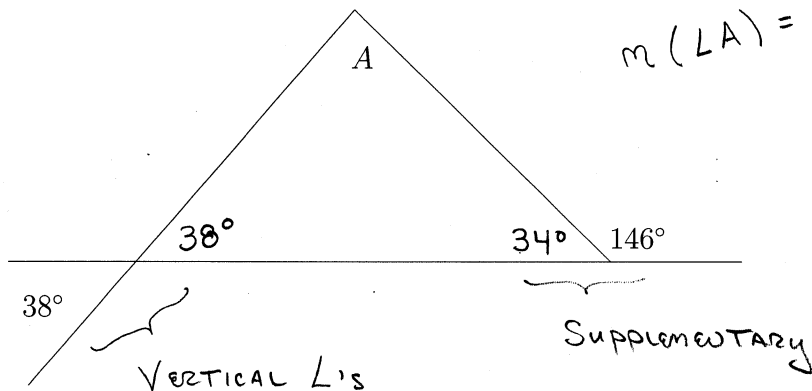
$30^\circ$

(d)  $m(\angle S)$

$60^\circ$



22. (5 points) Find the measure of  $\angle A$ . Briefly explain your reasoning.



$$m(\angle A) = 180^\circ - (38^\circ + 34^\circ) = 108^\circ$$