



Name:

Chapter 5 Review: Polygons and Quadrilaterals

1. The test will be **Wednesday, December 21st, 2011.**
2. The test is **26 questions** and is a mix of multiple choice and constructed response questions.
3. You will be able to use a calculator on the test.
4. You may **NOT** use notes, phones, i-pods, or other personal electronic devices.
5. You **must finish the test in class** on Wednesday so come on time and ready to start.

Learning Targets/Topics:

5A: I can find the sum of the measures of interior angles in a polygon. **5 Questions**

- Finding the sum of the interior angles of a polygon given the number of sides
- Finding the measures of one interior angle in a **regular** polygon
- Finding the number of sides given the total sum of the interior angles
- Finding missing angles in a polygon with and without algebra

5B: I can determine the sum of the measures of the exterior angles. **3 Questions**

- The sum of the exterior angles of any polygon is 360 degrees.
- Finding the number of sides of a polygon given the measures of one exterior angle in a regular figure.
- Finding missing exterior angles (no algebra)

5C: I can apply the properties of kites and trapezoids. **6 Questions**

- Finding missing sides and angles in kites.
- Finding missing sides in kites given the perimeter.
- Using the properties of a kite's diagonals to find missing angles.
- Finding missing angles in a trapezoid.
- Finding missing sides in a trapezoid using algebra.

5D: I can apply properties of midsegments to find missing measurements. **2 Questions**

- Find the length of the midsegment of a trapezoid given the 2 bases.
- Find the measure of angles in a trapezoid with a midsegment.
- Find the length of a triangle's sides given the length of a side or of a midsegment.

5E: I can apply properties of parallelograms to solve problems. **3 Questions**

- Finding missing angles in a parallelogram including angles formed by a diagonal.
- Finding missing angles in a parallelogram using algebraic expressions.
- Finding missing side lengths in a parallelogram using algebra.

5F: I can apply properties of special parallelograms. **4 Questions**

- Finding missing angles formed by the diagonals of a rhombus using algebra.
- Finding the length of a rectangle's diagonal using algebra.
- Finding the length of a square's side using the perimeter and algebra.
- Comparing and contrasting the properties of special parallelograms.

5G: I can prove properties of parallelograms **2 Questions**

- Use slopes (coordinate geometry) to prove a figure is a parallelogram or trapezoid.
- Write a 2 column proof involving a parallelogram.

5H: I can solve systems of equations. **1 Question**

- Solve a system of equations by graphing.

5A: I can find the sum of the measures of interior angles in a polygon.

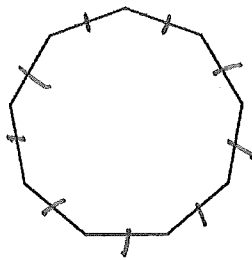
1. What formula can you use to find the sum of the interior angles in a polygon?

$$(n-2)180$$

2. What is the sum of the interior angles in a polygon with 23 sides?

$$(23-2)180 = \boxed{3,780^\circ}$$

3. What is the measure of 1 interior angle in the regular polygon below?



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

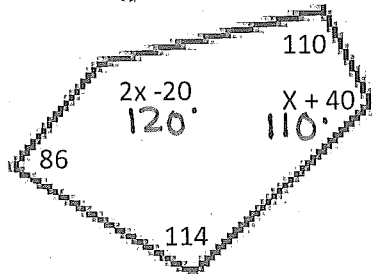
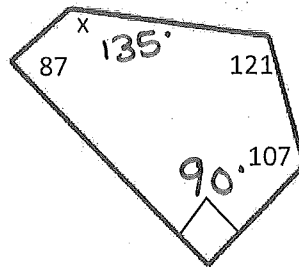
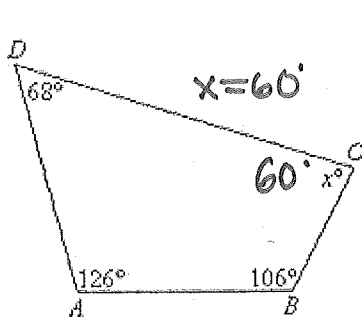
4. Find the number of sides in a polygon if the sum of the interior angles is 1,980 degrees?

$$\frac{(n-2)180}{180} = \frac{1980}{180}$$

$$n-2 = 11$$

$$\boxed{n=13 \text{ sides}}$$

5. Find the missing angles in the figures below.



$$\begin{array}{r} 546 \\ - 310 \\ \hline 230 \end{array}$$

$$3x + 20 = 230$$

$$\begin{array}{r} 3x = 210 \\ \hline \boxed{x = 70} \end{array}$$

5B: I can determine the sum of the measures of the exterior angles.

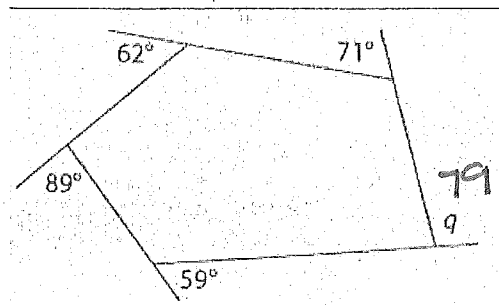
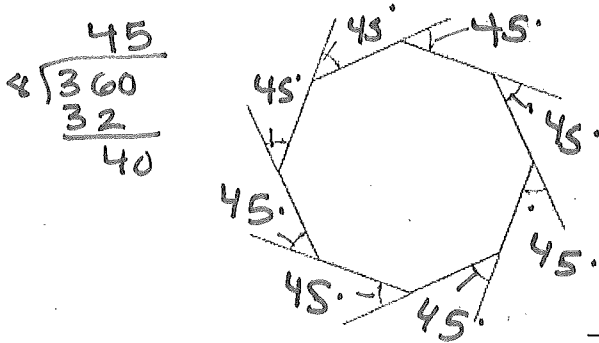
6. What is the sum of the exterior angles of a pentagon? A heptagon?

360°

7. If the measure of a regular exterior angle is 120 degrees, how many sides does the polygon have?

3 sides → triangle

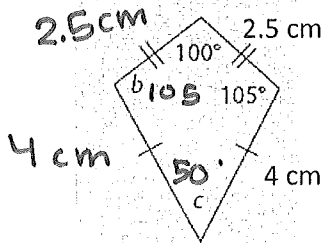
8. Find the missing angles in the figures below.



Handwritten division:
$$\begin{array}{r} 360 \\ - 281 \\ \hline 79 \end{array}$$

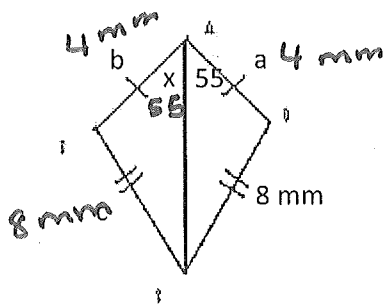
5C: I can apply the properties of kites and trapezoids.

9. Find the missing side lengths and angles in the kite below.



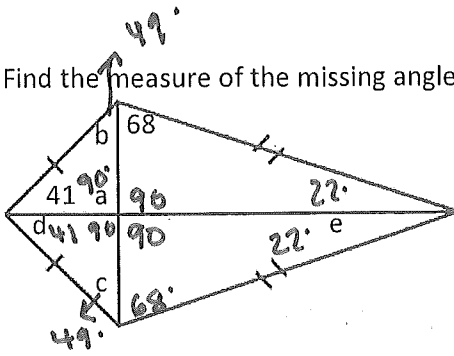
Handwritten solutions: $b = 105^\circ$
 $c = 50^\circ$

10. If the perimeter of the kite below is 24 units, find the length of the missing sides and the angles.



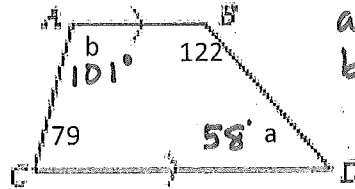
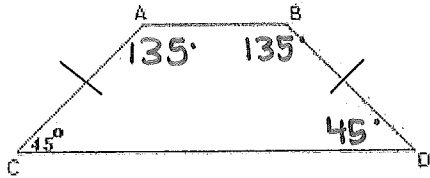
Handwritten solutions: $x = 55^\circ$
 $a = 4 \text{ mm}$
 $b = 4 \text{ mm}$
 $c = 8 \text{ mm}$

11. Find the measure of the missing angles in the figure below.



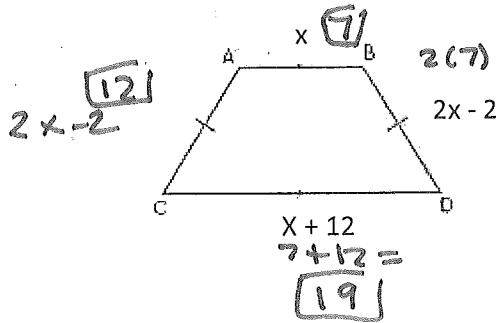
$$\begin{aligned} a &= 90^\circ \\ b &= 49^\circ \\ c &= 49^\circ \\ d &= 41^\circ \\ e &= 22^\circ \end{aligned}$$

12. Find all missing angles in the trapezoids below.



$$\begin{aligned} a &= 58^\circ \\ b &= 101^\circ \end{aligned}$$

13. Find the value of x and the length of each side. The perimeter of the isosceles trapezoid is 50.



$$2(7) - 2 = \boxed{12}$$

$$6x + 8 = 50$$

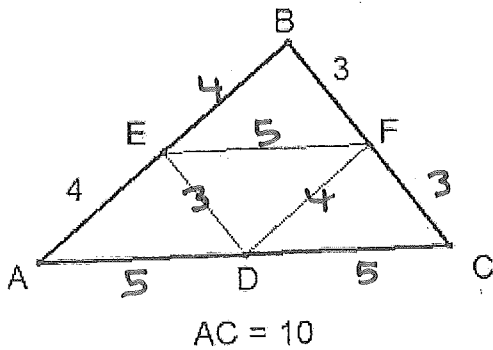
$$6x = 42$$

$$\boxed{x = 7}$$

$$\begin{aligned} x + 12 \\ 7 + 12 = \\ \boxed{19} \end{aligned}$$

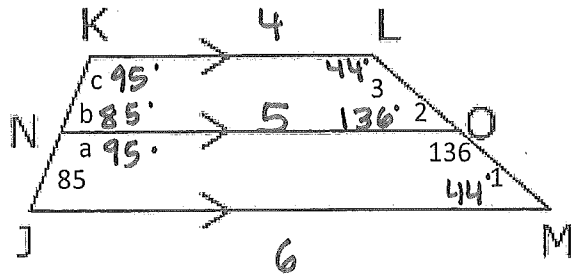
5D: I can apply the properties of midsegments.

14. Find the length of all missing segments in the figure below. Points E, F, and D are all midpoints.



$$\begin{aligned} \overline{EB} &= 4 \\ \overline{AD} &= 5 \\ \overline{EF} &= 5 \\ \overline{ED} &= 3 \\ \overline{DF} &= 4 \\ \overline{AC} &= 10 \end{aligned}$$

15. Find the measure of all missing angles and line segments in the figure below.



$a = 95^\circ$
 $b = 85^\circ$
 $c = 95^\circ$
 $1 = 44^\circ$
 $2 = 44^\circ$
 $3 = 44^\circ$
 136°

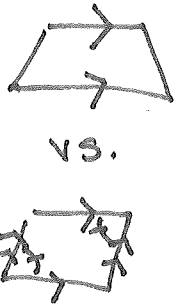
$\overline{JM} = 6$ $\overline{NO} = ?$ 5
 $\overline{KL} = 4$

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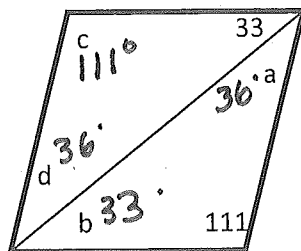
5E: I can apply the properties of parallelograms.

16. What are 2 differences between a parallelogram and a trapezoid?

- ① trapezoid has 1 set of parallel sides whereas a parallelogram has 2 sets of parallel sides
- ② opposite angles in a parallelogram are congruent

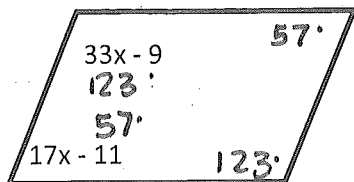


17. Find the measure of the missing angles in the parallelogram below.



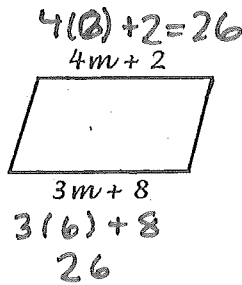
$a = 36^\circ$
 $b = 33^\circ$
 $c = 111^\circ$
 $d = 36^\circ$

18. Find the value of x and the measure of each angle in the parallelogram below.



$50x - 20 = 180$
 $50x = 200$
 $x = 4$
 5

19. Find the value of m in the parallelogram below.



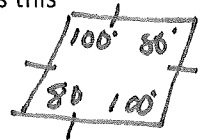
$$4m+2 = 3m+8$$

$$\boxed{m=6}$$

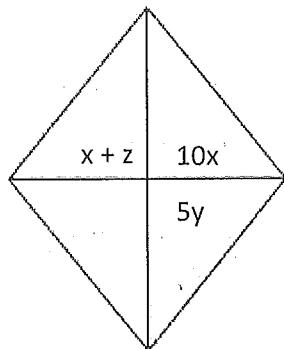
5F: I can apply the properties of special parallelogram (rhombuses, rectangles, and squares).

20. True or False: A rhombus has 4 congruent sides and 4 congruent angles. If false, why is this statement incorrect?

False, a rhombus does not necessarily have 4 congruent angles. It does always



21. Find the value of x , y , and z in the figure below.



$$10x = 90$$

$$\boxed{x=9}$$

$$5y = 90$$

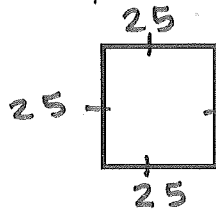
$$\boxed{y=18}$$

$$x+z = 90$$

$$9+z = 90$$

$$\boxed{z=81}$$

22. The perimeter of the square below is 100. Find the value x and the length of each side.



$$5x-10 = 25$$

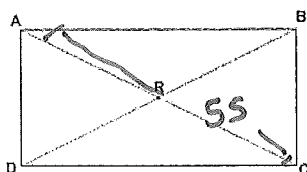
$$5x = 35$$

$$\boxed{x=7}$$

$$100 \div 4 = 25$$

↑
length of each side

23. In the rectangle below diagonal AC has a length of 55 units. If $DB = 34x + 21$, find the value of x AND the length of AR .



$$34x+21 = 55$$

$$34x = 34$$

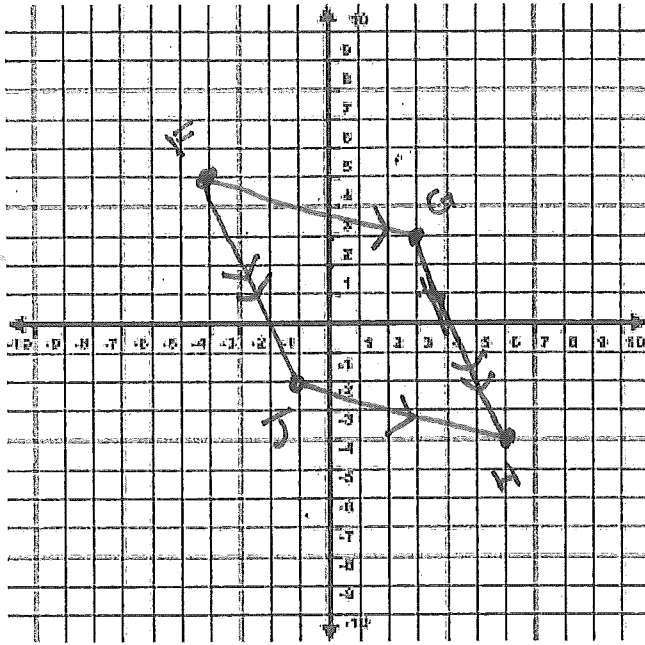
$$\boxed{x=1}$$

$$\boxed{AR = 27.5}$$

5G: I can prove properties of quadrilaterals.

24. A quadrilateral has vertices F (-4, 5), G (3, 3), H (6, -4), and J (-1, -2). Asher claims figure FGHI is a parallelogram. Ayla claims figure FGHI is a trapezoid. Amir claims FGHI is neither a trapezoid nor a parallelogram. Who is correct? Use slopes to prove your answer.

Yes it is a parallelogram because opposite sides are parallel:



$$F(-4, 5) \quad G(3, 3) \quad M = \frac{3-5}{3+4} = -\frac{2}{7}$$

$$J(-1, -2) \quad H(6, -4) \quad M = \frac{-4+2}{6+1} = -\frac{2}{7}$$

$$\overline{FG} \parallel \overline{JH}$$

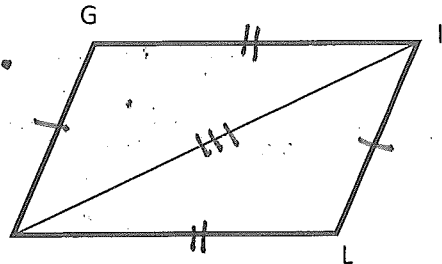
$$G(3, 3) \quad H(6, -4) \quad M = \frac{-4-3}{6-3} = -\frac{7}{3}$$

$$F(-4, 5) \quad J(-1, -2) \quad M = \frac{-2-5}{-1+4} = -\frac{7}{3}$$

$$\overline{GH} \parallel \overline{FJ}$$

25. Write a 2 column proof for the following:

Given: $GIRL$ is a parallelogram
 Prove: $\angle GRI \cong \angle LIR$



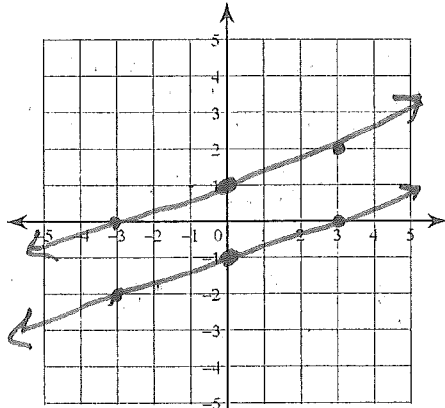
Statement	Reason
1. $\overline{RG} \cong \overline{IL}$	1. Definition of a parallelogram
2. $\overline{GI} \cong \overline{LR}$	2. Def. of a parallelogram
3. $\overline{RI} \cong \overline{RI}$	3. Reflexive Property
4. $\triangle RGI \cong \triangle IRL$	4. SSS Theorem
5. $\angle GRI \cong \angle LIR$	5. CPCTC

5H: I can solve systems of equations.

26. Solve each system of equations below by graphing.

$$y = \frac{1}{3}x - 1$$

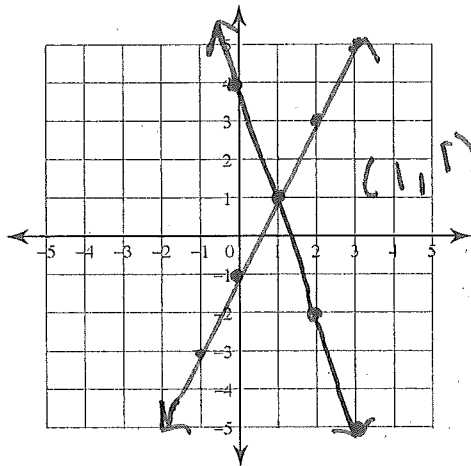
$$y = \frac{1}{3}x + 1$$



NO SOLUTION
Parallel Lines

$$y = -3x + 4$$

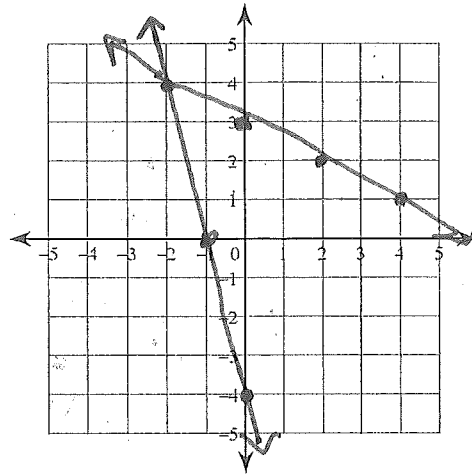
$$y = 2x - 1$$



(1, 1)

$$y = -\frac{1}{2}x + 3$$

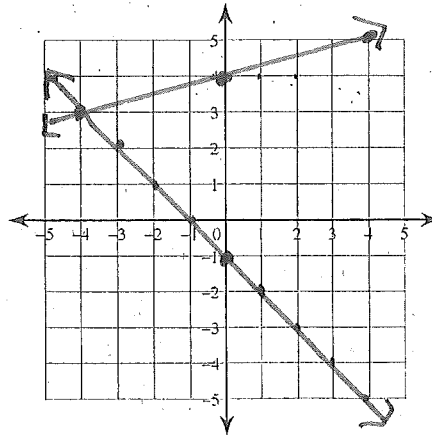
$$y = -4x - 4$$



(-2, 4)

$$y = \frac{1}{4}x + 4$$

$$y = -x - 1$$



(-4, 3)

Bonus: Solve using substitution or elimination:

$$y = x + 14$$

$$x - y = -14$$