Name:_____

Monica

Geometry Period:_____ Date:_____

Outcome	Question #s
#01: Argues with different types of reasoning in order to prove or disprove a statement	17
#04: Be precise in calculating and applying the length and midpoint of a segment	15, 16
#06: Graphically and algebraically discerns if lines are parallel or perpendicular on a coordinate plane and can identify the point of intersection of intersecting lines	7, 8, 14
#07: Identifies polygons precisely and can determine angle sums and missing angle measures	10 – 13
#08: Concludes if two triangles are congruent and identifies corresponding parts	17
#10: Discerns and applies theorems and relationships about quadrilaterals and communicates those relationships	1 – 9, 14, 16

1) Determine if the following statements are true or false.

a. __F__ The diagonals of a parallelogram bisect the angles.

b. __F__ Consecutive angles in a parallelogram are complementary.

c. __T__ The diagonals of a kite are perpendicular.

d. __T__ The diagonals in a square are congruent.

e. __T__ All squares are rectangles.

f. __T__ Opposite angles in a parallelogram are congruent.

g. __T__ The diagonals of a parallelogram bisect each other.

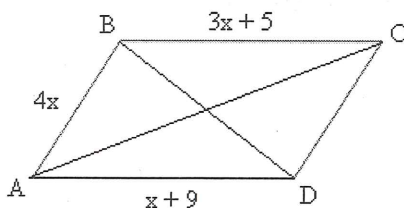2) Determine the length of MN in the trapezoid below.
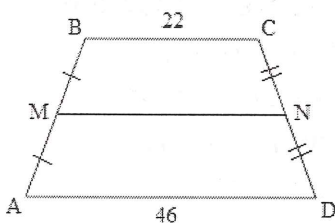
$$\frac{22 + 46}{2} = MN$$

$$\frac{68}{2} = MN$$

$$34 = MN$$

3) Determine the length of AB in the parallelogram below.

$$3x + 5 = x + 9$$
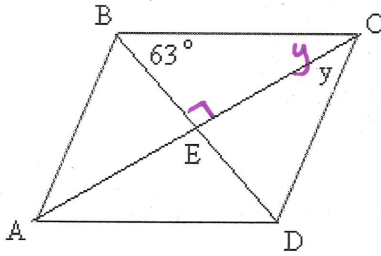
$$2x + 5 = 9$$

$$2x = 4$$

$$x = 2$$

$$AB = 4x$$

$$AB = 4(2)$$

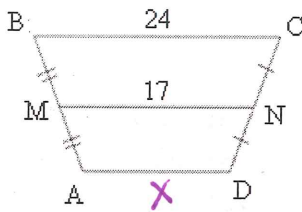$$AB = 8$$

4) Determine the value of y in the rhombus below.

B   C
63°   y
   E
A   D

$$y + 63 + 90 = 180$$
$$y + 153 = 180$$
$$\boxed{y = 27}$$

5) Determine the length of AD in the trapezoid below.

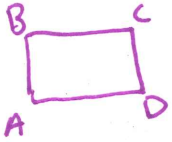B   24   C
   17
M   N
A   X   D

$$\frac{24 + X}{2} = 17$$
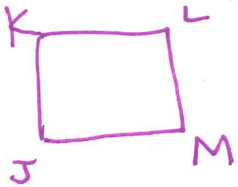$$24 + X = 34$$
$$X = 10$$

$$\boxed{AD = 10}$$

7) The slope of side AB in rectangle ABCD is $-\dfrac{4}{5}$. What is the slope of side AD? Why?

B   C
A   D

The slope of AD is $\frac{5}{4}$. Since a rectangle has 4 90° angles, the adjacent sides must be $\perp$ which means they have negative reciprocal slopes.

8) The slope of side KL in square JKLM is 0. What is the slope of side LM? Why?

K   L
J   M

The slope of LM is undefined. The negative reciprocal of 0 is undefined.

9) Match each definition to the appropriate quadrilateral. (There are more words than definitions!)

___d___ 1. A parallelogram with four right angles

___b___ 2. A quadrilateral with both pairs of opposite sides parallel

___f___ 3. A quadrilateral with two pairs of adjacent sides congruent and no opposite sides congruent

___c___ 4. A parallelogram with four congruent sides

a. Quadrilateral
b. Parallelogram
c. Rhombus
d. Rectangle
e. Square

f. Kite
g. Trapezoid
h. Isosceles Trapezoid

10) The measure of one interior angle in a regular polygon is 160°. How many sides does this polygon have?

$$\frac{(n-2) \times 180}{n} = 160$$

$$(n-2) \times 180 = 160n$$

$$180n - 360 = 160n$$
$$-360 = -20n$$
$$\boxed{18 = n}$$

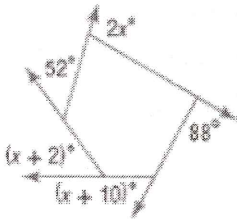11) What is the sum of the interior angles in a regular decagon?

$$(10-2) \times 180$$
$$8 \times 180$$
$$\boxed{1440°}$$

12) What is the measure of one exterior angle in a regular pentagon?

$$\frac{360}{5} = \boxed{72°}$$

13) Find the value of x in the diagram below.

$$2x + 88 + x + 10 + x + 2 + 52 = 360$$
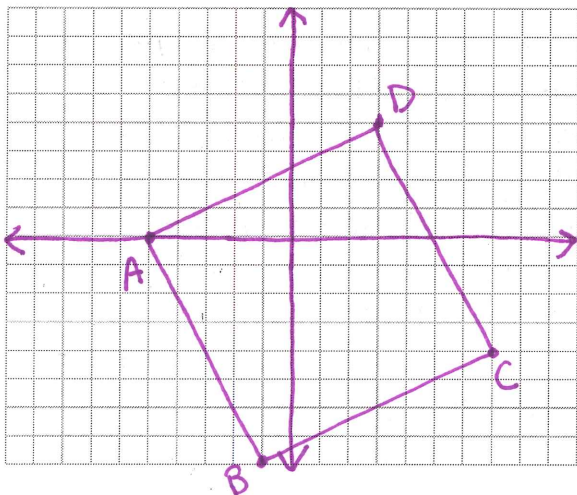$$4x + 152 = 360$$
$$4x = 208$$
$$\boxed{x = 52}$$

14)

Given: Quadrilateral $ABCD$ with $A(-5, 0)$, $B(-1, -8)$, $C(7, -4)$, $D(3, 4)$.
Prove: $ABCD$ is a rectangle.

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$AD = \frac{4-0}{3--5} = \frac{4}{8} = \frac{1}{2}$$

$$DC = \frac{4--4}{3-7} = \frac{8}{-4} = -2$$

$$BC = \frac{-4--8}{7--1} = \frac{4}{8} = \frac{1}{2}$$

$$AB = \frac{-8-0}{-1--5} = \frac{-8}{4} = -2$$

negative reciprocal slopes

ABCD is a rectangle because the adjacent sides are perpendicular

15) What is the length of a segment with endpoints (-4, 5) and (6 -3)? Write your answer in simplest radical form.

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(6 - {}^-4)^2 + (-3 - 5)^2}$$

$$\sqrt{(10)^2 + (-8)^2}$$

$$\sqrt{100 + 64}$$

$$\sqrt{164}$$

$$\sqrt{164} = \sqrt{4}\,\sqrt{41}$$

$$\boxed{= 2\sqrt{41}}$$

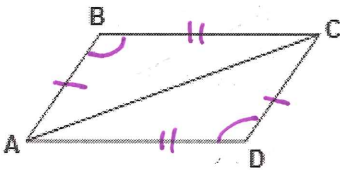16) Trapezoid ABCD is shown on the coordinate plane below. Prove that trapezoid ABCD is isosceles.

$$AD = \sqrt{(-3 - {}^-6)^2 + (1 - {}^-3)^2}$$

$$= \sqrt{(3)^2 + (4)^2}$$

$$= \sqrt{9 + 16}$$

$$= \sqrt{25} = 5$$
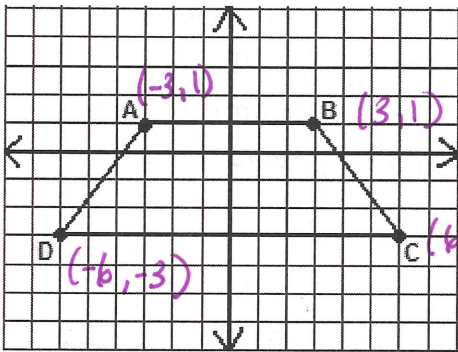
$$BC = \sqrt{(3 - 6)^2 + (1 - {}^-3)^2}$$

$$= \sqrt{(-3)^2 + (4)^2}$$

$$= \sqrt{9 + 16}$$

$$= \sqrt{25} = 5$$

Since the non-parallel sides are ≅, trapezoid ABCD is isosceles.

17) Given: ABCD is a parallelogram
Prove: $\triangle ABC \cong \triangle CDA$

Statements	Reasons
1. ABCD is a parallelogram	1. Given
2. $\overline{AB} \cong \overline{CD}$	2. opp. sides in a parallelogram are ≅
3. $\overline{BC} \cong \overline{DA}$	3. opp. sides in a parallelogram are ≅
4. $\angle B \cong \angle D$	4. opp. angles in a parallelogram are ≅
5. $\triangle ABC \cong \triangle CDA$	5. SAS