A. Definitions
1) Acute angle
2) Acute triangle
3) Adjacent angles
4) Alternate exterior angles
5) Alternate interior angles
6) Altitude of a triangle
7) Angle
8) Angle bisector of a triangle
9) Angles bisector
10) Base of an isosceles triangle
11) Collinear
12) Complementary angles
13) Congruent angles
14) Congruent polygons
15) Congruent segments
16) Congruent triangles
17) Consecutive interior angles
18) Contrapositive
19) Converse
20) Convex polygon
21) Concave polygon
22) Corollary
23) Corresponding angles
24) Counterexample
25) Decagon
26) Diagonal of a polygon
27) Distance between points
28) Equiangular triangle
29) Equiangular polygon
30) Equilateral polygon
31) Equilateral triangle
32) Exterior angle
33) Exterior of an angle
34) Heptagon
35) Hexagon
36) Hypotenuse
37) Hypothesis
38) Interior angle of a polygon
39) Interior of an angle
40) Intersecting lines
41) Isosceles trapezoid
42) Isosceles triangle
43) Kite
44) Leg of an isosceles triangle
45) Leg of a right triangle
46) Linear pair
47) Line perpendicular to a plane
48) Measurement of an angle
49) Median
50) Midpoint
51) Midsegments of a trapezoid
52) Midsegments of a triangle
53) N-gon
54) Negation
55) Nonagon
56) Obtuse angle
57) Obtuse triangle
58) Octagon
59) Opposite rays
60) Parallel lines
61) Parallelogram
62) Parallel planes
63) Pentagon
64) Perpendicular bisector
65) Perpendicular lines
66) Polygon
67) Quadrilateral
68) Ray
69) Rectangle
70) Regular polygon
71) Remote interior angles
72) Rhombus
73) Right angle
74) Right triangle
75) Scalene triangle
76) Segment
77) Segment bisector
78) Skew lines
79) Square
80) Straight angle
81) Supplementary angles
82) Transversal
83) Trapezoid
84) Vertical angles
85) Vertex of a triangle
86) Vertex angle of an isosceles triangle

B. Algebraic Properties
Reflexive, symmetric, transitive, substitution, addition, subtraction, multiplication, division

C. Formulas
Slope formula
Midpoint formula
Distance formula
Point slope formula
Slope intercept formula
Slope of parallel lines
Slope of perpendicular lines
Sum of the interior angles of a convex polygon
Sum of the exterior angles of a convex polygon
Measure of one interior angle of a regular polygon
Measure of one exterior angle of a regular polygon

D. Listings
List the things that can and cannot be assumed from a figure
List the undefined terms of geometry
List all properties of parallelograms, rectangles, rhombi, and squares
List all the properties of trapezoids, isosceles trapezoids, and kites
List the ways to prove triangles congruent
Solve the following:

1) M is between L and N. \( \overline{ML} = \frac{1}{4} \overline{MN} \) and \( \overline{LN} = 25 \).
    Find \( ML \) and \( MN \).

2) M is between L and N. \( \overline{LM} = \frac{1}{3} \overline{LN} \) and \( \overline{MN} = 36 \).
    Find \( LM \) and \( LN \).

3) \( \angle GFI \) is a right angle. \( m \angle JFH = m \angle EFJ \), \( m \angle EFJ = (4x + 12)° \), \( m \angle EFH = (10x)° \), Find \( m \angle EFJ \)

4) \( \angle GFI \) is a right angle. \( m \angle JFH = m \angle EFJ \), \( m \angle HFG = (3x + 2)° \), \( m \angle HFI = (5x + 16)° \), Find \( m \angle HFG \)

5) \( \overline{YM} \) bisects \( \angle XYZ \), \( m \angle XYZ = 6x^2° \), \( m \angle XYM = (27x - 42)° \).
    Find \( m \angle MYZ \).

6) \( \overline{YM} \) bisects \( \angle XYZ \), \( m \angle MYZ = 3(x - 2)° \), \( m \angle XYZ = \left(\frac{3x}{2}\right)° \).
    Find \( m \angle XYZ \).

7) \( \triangle MNO \) is an isosceles triangle with vertex \( M \). \( MO = 2x + 7 \), \( NO = 4x + 6 \), \( m \angle O = 5x° \). The perimeter of \( \triangle MNO = 76 \), find \( m \angle O \).

8) The ratio of the measure of an angle to its supplement is 4:5.
    Find the measure of the angle and its supplement.

9) The measure of the complement of an angle is 10 more than 3 times the measure of the angle. Find the measure of the angle and its complement.

10) \( \overline{BC} \) bisects \( \angle ABD \), \( m \angle ABD = 64° \). \( \overline{BC} \parallel \overline{DE} \). Find \( x \) and \( y \).

11) \( \overline{AB} \parallel \overline{CD} \). \( \overline{AB} \perp \overline{BC} \). Find \( x \) and \( y \).

In 12 and 13, determine the values of \( x \) and \( y \) for which \( a \parallel b \).

12) \( m \angle 3 = (2x - y)° \), \( m \angle 6 = (x + 2y)° \), \( m \angle 7 = 75° \).

13) \( m \angle 2 = 63° \), \( m \angle 3 = (x - 3y)° \), \( m \angle 6 = (7x - 2y + 2)° \).
14) The measure of the angles of a triangle are represented by 
\[2x + 15, \ x + 2, \text{ and } 3x + 25\]. Find the measure of each angle.

15) Given a right triangle with an altitude drawn to the hypotenuse. Find x.

16) Compare \(m\angle 1\) and \(m\angle 3\).
    Compare \(m\angle 6\) and \(m\angle 2\).
    Compare \(m\angle 7\) and \(m\angle 4\).

17) Find the sum of the measures of the interior angles of a polygon with 18 sides.

18) Find the sum of the measures of the exterior angles of a polygon with 19 sides.

19) Find the number of sides in a polygon whose interior angles have a sum of 4500°.

20) Find the measure of one interior angle of a regular polygon with 16 sides.

21) The measure of one interior angle of a regular polygon is 160°. Find the number of sides.

22) The measure of one exterior angle of a regular polygon is 24°. Find the number of sides.

23) Find the measure of one exterior angle of a regular polygon with 13 sides.

24) \(\overline{NO}\) is a midsegment of trapezoid LMPQ with bases LM and PQ. \(NO = 3x + 4, \ LM = x - 3, \ PQ = 37\). Find \(NO\) and \(LM\).

25) F and H are midpoints of \(\overline{EG}\) and \(\overline{GI}\) respectively in \(\triangle GEI\). \(FH = x - 2, \ EI = x + 7\). Find \(FH\) and \(EI\).

26) If 2 sides of a triangle have lengths of 7 and 13, find the possible lengths of the third side.

27) Write a conditional sentence for "A square is a rectangle".

28) State the hypothesis and the conclusion of problem 27.

29) Is the conditional true? Why or why not?

30) Write the converse of problem 27.

31) Is the converse true? Why or why not?

32) Write the contrapositive of problem 27.

33) Is the contrapositive true? Why or why not?
34) Name the parallelogram with only:
   a. diagonals perpendicular and congruent.
   b. diagonals congruent.
   c. diagonals that bisect opposite angles.

35) What is the exterior angle theorem?

36) How many lines can be drawn through exactly 2 points? Justify your answer.

37) How many planes can be drawn through exactly 3 non collinear points? Justify your answer.

38) Write the negation of the statement “Tomorrow is my birthday”

39) What is the difference between inductive reasoning and deductive reasoning?

40) Are \( \angle XYZ \) and \( \angle ZXY \) the same angle? Justify your answer.

41) Does \( m\angle MNO + m\angle ONP = m\angle MNP \)? Justify your answer.

42) Is the sum of three acute angles always an obtuse angle? Justify your answer.

43) Does the bisector of an obtuse angle always form 2 acute angles? Justify your answer.

44) Can a right triangle be isosceles? Justify your answer.

45) Can an obtuse triangle be a scalene? Justify your answer.

46) Can the supplement of a right angle be an acute angle? Justify your answer.

47) If one segment is a bisector of a second segment, will the second segment be the bisector of the first? Justify the answer.

48) Are rectangles rhombi? Justify your answer.

49) Are squares rectangles? Justify your answer.

50) Are trapezoids quadrilaterals? Justify your answer.

51) Are parallelograms trapezoids? Justify your answer.

52) Do the diagonals of a trapezoid bisect each other? Justify your answer.

53) Given triangle ABC with A(2,4); B(-3,6), C(1,3)
   a. Find the equation of the median \( \overline{BC} \).
   b. Find the equation of the altitude from point A.
   c. Find the equation of the perpendicular bisector to side AC.

54) \( K \) is between \( L \) and \( N \). If \( LK = 36 \) and \( KN = 10 \), then \( LN = ? \)

55) Segment \( \overline{AB} \) has endpoints at (2,6) and (10,0). Its midpoint, \( M \), is

56) Given: \( XM \) bisects \( \angle AXB \). If \( m\angle AXM = 2x + 7 \) and \( m\angle MXB = 4x - 5 \), find \( m\angle AXB \).
Find the values for x.

57) \[
\frac{x}{2} - 10 > \frac{7}{12}
\]

58) \[
(3x + 9) < 57
\]

59) Factor the following equation. \[ x^2 + 13x + 22 \]

60) Solve the following System. \[ 3x + 5y = 23 \]; \[ 4x - 5y = -16 \]

61) Factor the following equation. \[ 5x^2 + 17x + 6 \]

62) Factor the following equation. \[ 10x^2 + 27x + 5 \]

63) Solve.
\[
\frac{x + 2}{3} = \frac{x - 1}{6}
\]

64) If \( \angle 1 = 32x + 16 \) and \( \angle 2 = 6x + 12 \), then \( x = \) _____?

65) If \( \angle RMK = 5x + 8 \), \( \angle KMT = 3x - 5 \), and \( \angle TML = 6x + 17 \), then \( x = \) _____?

Find the value of x.

72) List the sides of \( \triangle ABC \) in order from shortest to longest. \( \angle A = 10x; \angle B = 5x - 17; \angle C = 7x - 1 \)
73) Use the figure below to find the indicated angle measures.

\[ \text{a \parallel b} \]
\[ m \angle 6 = 36^\circ \]
\[ \text{c \parallel d} \]
\[ m \angle 1 = 123^\circ \]

\[ m \angle 2 = \ldots \]
\[ m \angle 3 = \ldots \]
\[ m \angle 4 = \ldots \]
\[ m \angle 5 = \ldots \]
\[ m \angle 13 = \ldots \]
\[ m \angle 15 = \ldots \]
\[ m \angle 16 = \ldots \]
\[ m \angle 17 = \ldots \]
\[ m \angle 18 = \ldots \]

Find the values for \( x \) and \( y \).

74)

\[ \text{Find the values for } x \text{ and } y. \]

75)

\[ \text{Find the values for } x \text{ and } y. \]

76) Given: \( l \parallel m; t \parallel s \)
Prove: \( \angle 5 \cong \angle 15 \)

77) Given: \( l \parallel m; \angle 7 \cong \angle 10 \)
Prove: \( t \parallel s \)

78) Given: \( \angle N \cong \angle X; \overline{WX} \text{ bisects } \overline{NX} \)
Prove: \( \triangle WMN \cong \triangle VMX \)

79) Given: \( DE \perp EF; BC \perp AB; EF \cong CB; \angle BCA \cong \angle EFD \)
Prove: \( DE \cong AB \)

#76–#77
80) Given: \( E \) is the midpoint of \( BC \), \( \angle ACB \cong \angle FBC \), \( \overline{AD} \cong \overline{CD} \), \( \overline{FB} \cong \overline{AD} \).
Prove: \( \triangle CDE \cong \triangle BFE \)

81) Given: \( \overline{AR} \perp \overline{CB} \), \( \overline{AR} \) bisects \( \angle CAB \).
Prove: \( \triangle ACR \cong \triangle ABR \)

82) Given: \( \overline{DB} \) bisects \( \overline{AC} \), \( \overline{AC} \) bisects \( \overline{DB} \).
Prove: \( \triangle AEB \cong \triangle CED \)

83) Given: \( \overline{EB} \cong \overline{DB} \), \( \angle A \) and \( \angle C \) are right angles, \( B \) is the midpoint of \( \overline{AC} \).
Prove: \( \triangle BEA \cong \triangle BDC \)

84) Given: \( \overline{TQ} \) bisects \( \angle RTS \), \( \overline{TQ} \perp \overline{RS} \).
Prove: \( \overline{TQ} \) bisects \( \overline{RS} \)

85) Given: \( \overline{DA} \cong \overline{CB} \), \( \overline{DA} \perp \overline{AB} \), \( \overline{CB} \perp \overline{AB} \).
Prove: \( \triangle DAB \cong \triangle CBA \)

Solve the following Quadratics.

86) \( 21x^2 - 52x + 7 = 0 \)  
87) \( 12x^2 - 12x - 24 = 0 \)  
88) \( 9x^2 + 6x - 8 = 0 \)  
89) \( 14x^2 + 50x - 24 = 0 \)

Solve the following systems.

90) \( \begin{align*} y &= -3x - 10 \\ x &= -30 + 5y \end{align*} \)  
91) \( \begin{align*} 2x - y &= 8 \\ x &= 5y + 4 \end{align*} \)  
92) \( \begin{align*} -5x - y &= -21 \\ 4x + 5y &= -21 \end{align*} \)  
93) \( \begin{align*} -3x &= 56 - 4y \\ y &= 12x + 104 \end{align*} \)

94) Write an equation of a line in slope intercept form that goes through the points \((5, 3)\) and \((7, -2)\).

95) Write an equation of a line that is parallel to the line \(y = 4x + 4\) and goes through the point \((3, -6)\).

96) Write an equation of a line that is perpendicular to \(y = -4x + 6\) and goes through the point \((5, -6)\).

97) Write an equation of a line that goes through the midpoint of segment \((4, 2)\) and \((2, -8)\) and is perpendicular to the segment.

Write an algebraic proof for each of the following

98) \( 5(x - 3) = 4(x + 2) \)
99) \( 14(x + 1) = -7(4 + x) \)
100) \( 4(2x + 11) = 76 \)