Geometry CP ISLO EXAM REVIEW – PART 1

Name_____ Teacher_____

Review Packet:

1. The format of the review packet is not the format of the exam.
2. Please refer back to previous notes, homework, and class examples for more practice.
3. Complete the packet to the best of your ability on your own, then bring your remaining questions to your teacher(s).

Exam Helpful Hints:

1. Read directions very carefully.
2. When necessary, draw a diagram!
3. *Use* the choices of multiple choice questions.

Exam Info:

1. Format: The exam will include multiple choice as well as open-ended questions.
2. Students will be allowed to use calculators (graphing calculators will be required to clear all memory!) You MUST bring your own! You will not be provided with one.
3. If you are found with any materials regarding this exam, or in your calculator, you will fail the exam with a ZERO.
4. No Cell phones are permitted in the exam area. Leave them at home or in your lockers.

Vocabulary: You are responsible for the following terms, theorems and postulates.

collinear Points
coplanar Points
ray
plane
line
line Segment
segment addition postulate
segement subtraction postulate
midpoint
bisect
acute angle
right angle
obtuse angle
straight angle
angle bisector
complementary angles
supplementary angles
adjacent angles
linear pair
vertical angles
linear pair postulate
vertical angle theorem
polygon
equilateral
equiangular
regular polygon
concave polygon
convex polygon
interior angles
exterior angles
conditional
converse
inverse
contrapositive

Parallel Lines
Perpendicular Lines
Skew Lines
Parallel Planes
Perpendicular Planes
Corresponding angles
a. Postulate
b. Converse
Alternate interior angles
a. Theorem
b. Converse
Alternate exterior angles
a. Theorem
b. Converse
Consecutive interior angles
a. Theorem
b. Converse

Triangle Congruence Postulates:

SSS
SAS
HL
ASA
AAS

Right Triangle
Scalene Triangle
Equilateral Triangle
Equiangular Triangle
Acute Triangle
Isosceles Triangle
Obtuse Triangle
Exterior Angle Theorem
Base Angles Theorem
a. Converse
Hinge Theorem
a. Converse
Triangle Inequality Theorem
Perimeter
Area of Triangle
Midsegment
a. Theorem
Perpendicular Bisector
Median
Altitude

Points, lines and planes

For questions 1-9, use the diagram to determine if the statement is* true *or* false*.

1. $\overline{BC}$ *and* $\overline{GE}$ are parallel

2. $\overline{AB}$ and $\overline{CD}$ are perpendicular

3. $\overline{GE}$ *and* $\overline{HD}$ are skew

4. B, J, and C are collinear

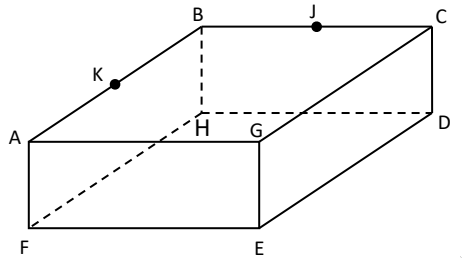
5. A, G, and E are collinear

6. B, J, H, and G are coplanar

7. A, G, H and D are coplanar

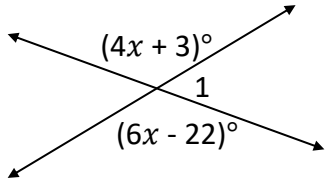
8. K is between A and B

9. There are no parallel planes in this diagram.

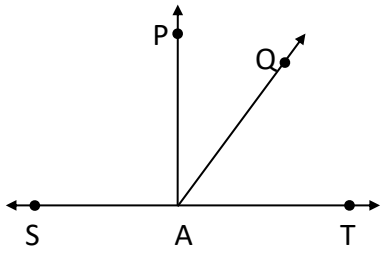


Angles

10. Use the diagram. Find the value of x and m$\measuredangle$1.



11. Use the diagram. $\overline{AQ}$ bisects $\measuredangle PAT$, $m\measuredangle QAT = 5x - 5$ and $m\measuredangle PAQ = x + 19$. Find the value of x, and the $m\measuredangle PAT$.



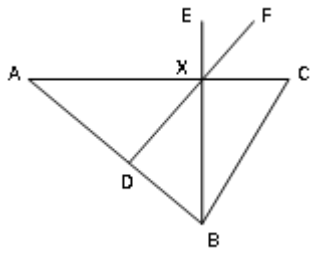
12. Two angles are supplementary. One angle is 5 less than 4 times the other. Find the measure of each angle.

13. Two angles are complementary. One angle is 4 times the other. Find the measure of the larger angle.

For questions 14-19, use the diagram. Given that $\overline{BX} \perp \overline{AC}$ and $\overline{AD} \cong \overline{DB}$, identify each of the following.

14. A right angle

15. Two congruent supplementary angles



16. Two non-congruent supplementary angles

17. Two adjacent complementary angles

18. A pair of vertical angles

19. A midpoint

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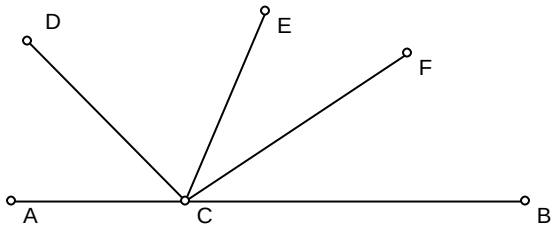
20. In the figure *below* $\overline{CE}$ bisects $\measuredangle DCB$ and $\overline{CF}$ bisects $\measuredangle ECB$.

$\measuredangle ECF = 4x + 7$, $\measuredangle FCB = 7x - 20$

a) Solve for x.



b) Determine the measure of $\measuredangle DCA$.

<u>Segment and Line Properties</u>

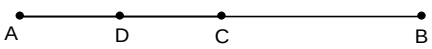
21. K is a point between A and B. $\overline{KA} = 3x$, $\overline{AB} = 2x + 8$, and $\overline{BK} = x - 5$.

    a) What is the length of $\overline{AB}$?

    b) Is K the midpoint of $\overline{AB}$?

22. H is the midpoint of $\overline{OP}$. $OP = 4x - 16$ and $HP = x + 4$. Find the length of $\overline{OH}$ and $\overline{OP}$.

23. In the diagram, C is the midpoint of $\overline{AB}$ and D is the midpoint of $\overline{AC}$.
    $\overline{AD} = 4x - 3$ $\overline{AB} = 12x + 26$



    a) Solve for x.

    b) What is the length of $\overline{CB}$?

24. What is the midpoint of the segment that connects the points $(4,6)$ and $(0,-4)$

25. M is the midpoint of segment $\overline{AB}$. Given $A(2,3)$ and $M(5,7)$, find the coordinates of endpoint B.

26. What is the slope of a line that is parallel to a line with slope $\frac{-3}{5}$?

27. What is the slope of a line that is perpendicular to a line that has a slope 3?

Parallel Lines

For questions 28-34, use the diagram to determine which lines, if any, are parallel based on the given statement.

28. $\measuredangle 3 \cong \measuredangle P$

29. $\measuredangle 4$ is supplementary to $\measuredangle 5$

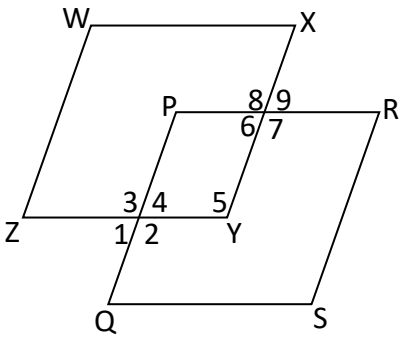
30. $\measuredangle Q \cong \measuredangle 7$

31. $\measuredangle 8 \cong \measuredangle 7$

32. $\measuredangle 5$ is supplementary to $\measuredangle X$

33. $\measuredangle Z \cong \measuredangle 4$

34. $\measuredangle 1 \cong \measuredangle P$

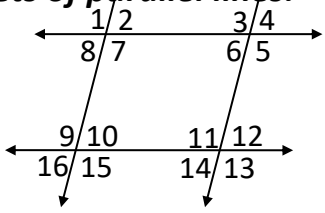


For questions 35-39, use the diagram which shows two sets of parallel lines.

35. If m$\measuredangle 1$ = 100°, find m$\measuredangle 14$.

36. If m$\measuredangle 9$ = 120°, find m$\measuredangle 6$.

37. If m$\measuredangle 2$ = 62°, find m$\measuredangle 12$.



38. If $\measuredangle 7 = (5x + 8)°$, $\measuredangle 14 = (12x + 2)°$, solve for x.

39. If $\measuredangle 6 = (8x + 5)°$, $\measuredangle 10 = (10x - 7)°$, solve for x.

Logic

For questions 42-46, use the conditional statement "If two angles are vertical, then they are congruent."

40. Write the converse: _____

41. Write the inverse: _____

42. Write the contrapositive: _____

43. Can this be written as a biconditional statement? _____

44. Since the conditional statement is true, which other statement is also true? _____

Triangles

45. The exterior angle at the base of an isosceles triangle measures 130°. Find the measure of the vertex angle.

46. In ΔABC, $m\measuredangle A = 40°$, $m\measuredangle C = 70°$ and $\overline{AC} = 5\ cm$. Find $\overline{AB}$.

47. The three angles of a triangle are $(x + 30)°$, $(4x + 30)°$ and $(10x - 30)°$. Find the value of the smallest angle.

48. ΔQRS is isosceles with $\measuredangle Q \cong \measuredangle S$. If $\overline{QR} = (x + 16)ft.$, $\overline{QS} = (3x - 30)ft.$ and $\overline{SR} = (2x - 20)ft$. Find the length of the base.

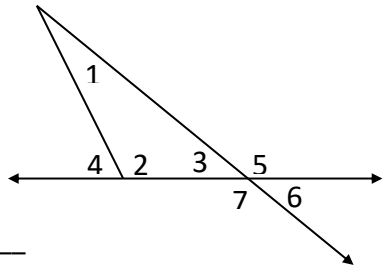
49. In ΔABC, $m\measuredangle A = 30°$ and $m\measuredangle B = 70°$. What is the largest side of the triangle?

50. In equilateral ΔCAR, point P is the midpoint of $\overline{CA}$, and point E is the midpoint of $\overline{CR}$. If $\overline{PE} = 8\ in.$, what is the perimeter of ΔCAR.

51. In ΔGHI, $m\measuredangle H$ is 20 more than $m\measuredangle G$ and $m\measuredangle G$ is 8 more than $m\measuredangle I$. What is the measure of each angle?

52. If a triangle has sides length 5 and 8, what are the possibilities for the length of the third side?

For questions 53-56, use the diagram.



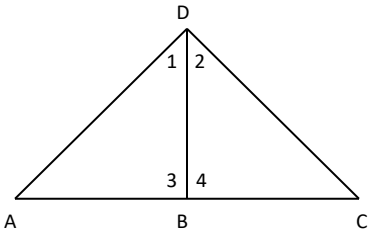
53. $m\measuredangle 1 = 40°, m\measuredangle 2 = 110°, m\measuredangle 5 =$ _____°

54. $m\measuredangle 1 = 55°, m\measuredangle 2 = 95°, m\measuredangle 6 =$ _____°

55. $m\measuredangle 4 = 118°, m\measuredangle 1 = (2x + 8)°, m\measuredangle 3 = (x + 5)°. x =$ _____

56. $m\measuredangle 1 = (3x + 12)°, m\measuredangle 2 = (2x + 14)°, m\measuredangle 3 = (8x - 15)°. x =$ _____

For questions 57-61, use the diagram to determine which method, if any, proves the triangles congruent.



57. $\overline{DB}$ is a median, $\measuredangle 3 \cong \measuredangle 4$.

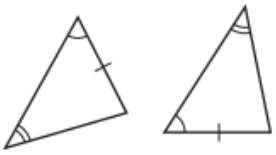
58. $\overline{DB} \perp \overline{AC}, \overline{AD} \cong \overline{DC}$

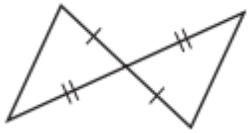
59. $\measuredangle 3 \cong \measuredangle 4, \measuredangle A \cong \measuredangle C$

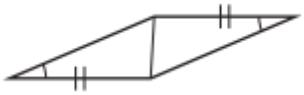
60. B is the midpoint of $\overline{AC}$

61. $\measuredangle 1 \cong \measuredangle 2, \overline{AB} \cong \overline{BC}$

For questions 62-64, if possible name the theorem/postulate that proves the triangles are congruent.

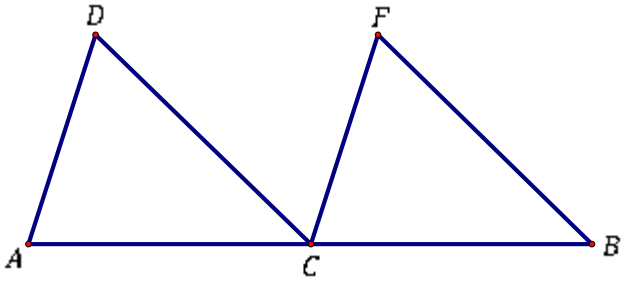
62. 

63. 

64. 

For questions 65 and 66, write a complete proof.

65. Given: C is the midpoint of $\overline{AB}$
$\overline{DC} \cong \overline{FB}$, $\overline{DC} \parallel \overline{FB}$
Prove: $\overline{DA} \cong \overline{CF}$



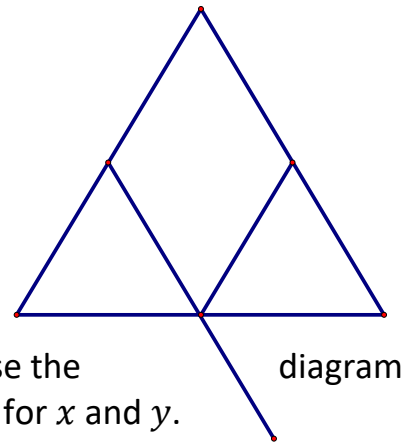
C

E F

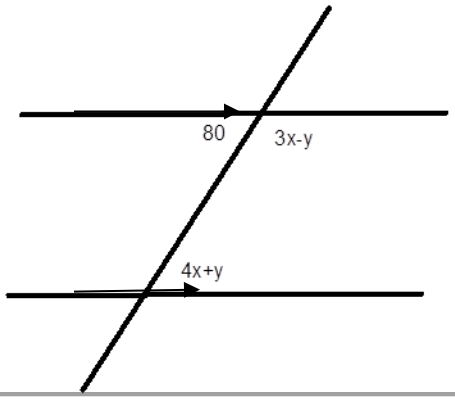
A D B

G

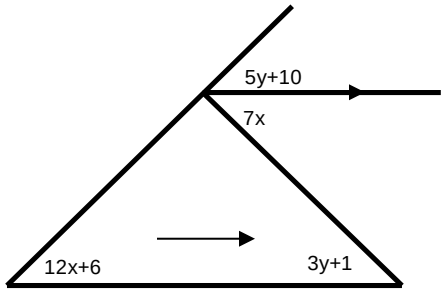
66. Given: $\overline{EG}$ bisects $\overline{AB}$
$\overline{ED} \cong \overline{FD}$
$\overline{DB}$ bisects $\measuredangle FDG$
Prove: $\measuredangle A \cong \measuredangle B$



67. Use the diagram to solve for x and y. Round to the nearest tenth.



68. Use the diagram to solve for x and y.



For questions 69-80, determine if the statement is* always, sometimes, *or* never *true.

69. If a triangle is isosceles it is also equilateral

70. "AAA" is a rule used to prove two triangles congruent.

71. If two angles are congruent, then they are vertical.

72. Angles that form a linear pair are complementary

73. In triangle ABC, if point D is the midpoint of $\overline{AB}$, then $\overline{CD}$ is a median of the triangle.

74. If alternate exterior angles are supplementary, then the lines are //.

75. An equilateral triangle is isosceles.

76. An acute triangle is right.

77. An acute triangle is isosceles.

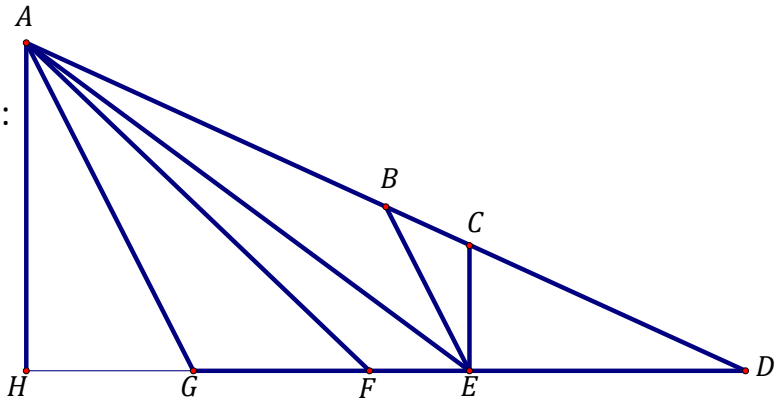
78. A right triangle is scalene.

79. An altitude of a triangle can be outside the triangle.

80. An angle bisector of a triangle is also the median of the triangle.

Special Segments in Triangles.

81. Use the following diagram to name each:



Given:
B is the midpoint of $\overline{AD}$, $\overline{GE} \cong \overline{ED}$,
$\measuredangle GAF \cong \measuredangle FAD$, $\overline{CE} \perp \overline{GD}$, $\overline{AH} \perp \overline{GD}$

a) Median of ΔAGD: _____

b) Altitude of ΔAGD: _____

c) Perpendicular bisector of ΔAGD: _____

d) Midsegment of ΔAGD: _____

e) Angle bisector ΔAGD: _____

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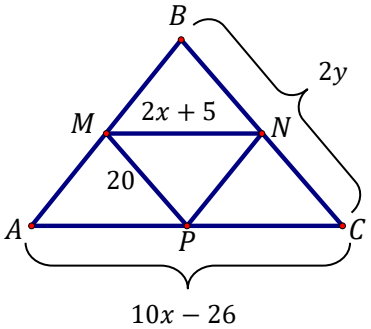
82. Given $M, N, and\ P$ are the midpoints of the sides of ΔABC:

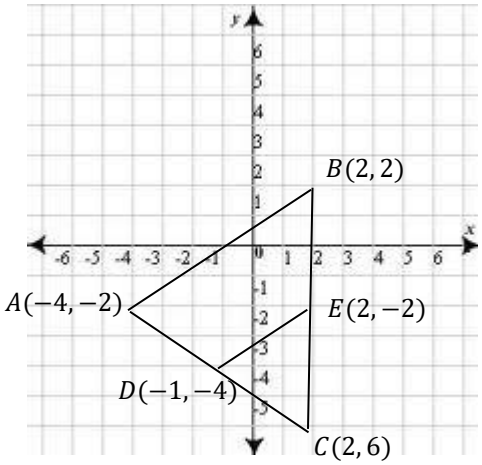
a) Find the value of x.

b) Find the value of y.



c) Find MN.

83. Verify the Midsegment Theorem for $\overline{DE}$ in ΔABC below.



a) Slope $\overline{DE}$ = _____

b) Slope $\overline{AB}$ = _____

c) DE = _____

d) AB = _____

e) Explain your conclusion using complete sentences:

_____

_____

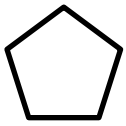
84. Is the triangle in question 83 equilateral?

Polygons

Identify if each shape is a polygon. If it is, state if it is convex or concave.

85. 

86. 

87. 

For questions 88-90, fill in the table.

Polygon	Sum of Interior Angles	Sum of Exterior Angles
88. Heptagon		
89. Dodecagon		
90. 15-gon		

For questions 91-93, fill in the table.

Regular Polygon	Each Interior Angle	Each Exterior Angle
91. Octagon		
92. Decagon		
93. 20-gon		

For questions 94-96, an interior angle measure is given. Name the regular polygon.

94. 135° 95. 170° 96. 144°

For questions 97-99, an exterior angle measure is given. Name the regular polygon.

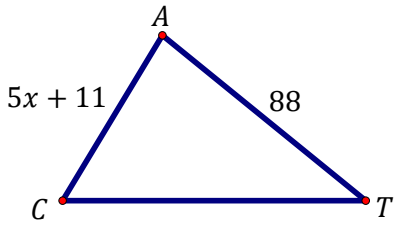
97. 72° 98. 5° 99. 40°

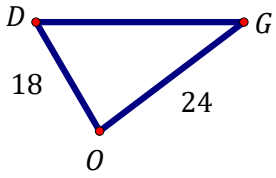
100. A pentagon has angle measures of $(3x + 15)°$, $(2x + 6)°$, $(3x - 24)°$, $(5x - 18)°$, and $(5x + 3)°$. Find the measure of the largest angle.

Similar Triangles

101. Given $\Delta WXY \sim \Delta LMN$, with a scale factor of $\frac{3}{7}$, if $\overline{WX}$ = 21, find $\overline{LM}$.

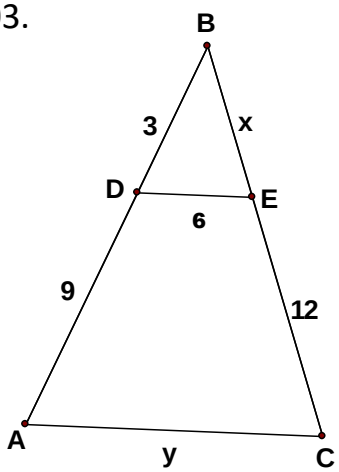
102. Given $\Delta CAT \sim \Delta DOG$, find the value of x.



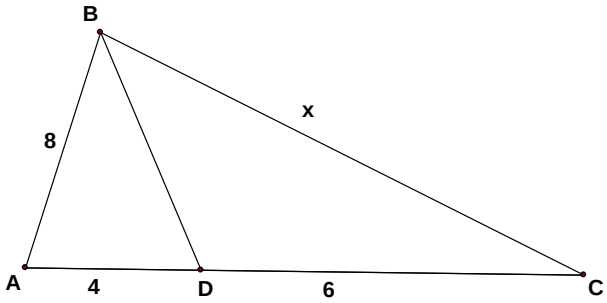


For questions 103-106, solve for the variables in each diagram.

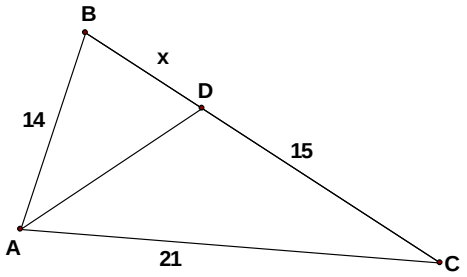
103.



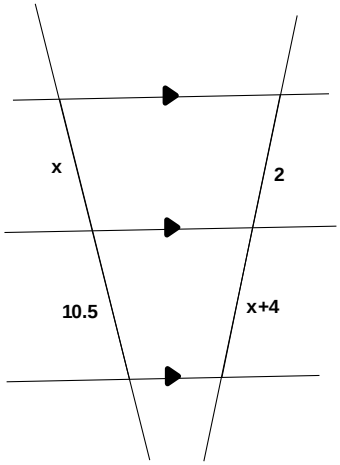
104. $\overline{BD}$ is the angle bisector of ∢ABC



105. $\overline{AD}$ is the angle bisector of ∢BAC



106.



Answer Key:

1. false
2. false
3. true
4. true
5. false
6. false
7. true
8. true
9. false
10. x = 12.5
    m∢1 = 127°
11. x = 6
    m∢PAT = 50°
12. m∢1 = 37°
    m∢2 = 143°
13. m∢1 = 18°
    m∢2 = 72°
14. multiple answers
15. multiple answers
16. multiple answers
17. ∢ADF and ∢FDB OR
    ∢BXD and ∢DXA
18. multiple answers
19. D
20. a) x = 9
    b) 8°
21. a) $\overline{AB}$ = 21
    b) not a midpoint
22. $\overline{OH}$ = 9
23. a) x = 9.5
    b) $\overline{CB}$ = 70
24. (2, 1)
25. (8, 11)
26. $-\frac{3}{5}$
27. $-\frac{1}{3}$
28. $\overline{ZY} \parallel \overline{PR}$
29. $\overline{XY} \parallel \overline{PQ}$
30. none
31. none
32. $\overline{WX} \parallel \overline{ZY}$
33. $\overline{WX} \parallel \overline{PQ}$
34. none
35. 80°
36. 60°
37. 62°
38. x = 10
39. x = 6

40. If two angles are congruent, then they are vertical.
41. If two angles are not vertical then they are not congruent.
42. If two angles are not congruent, then they are not vertical.
43. No; the converse is not true.
44. contrapositive
45. 80°
46. $\overline{AB}$ = 5cm
47. 70°
48. 78ft
49. $\overline{AB}$
50. 48in
51. m∢G = 56°
    m∢H = 76°
    m∢I = 48°
52. 3 < x < 13
53. 150°
54. 30°
55. x = 35
56. x = 13
57. SAS
58. HL
59. AAS
60. NEI
61. NEI
62. AAS
63. SAS
64. NEI

65.

Statements	Reasons
1. C is the midpoint of $\overline{AB}$, $\overline{DC} \cong \overline{FB}$, $\overline{DC} \parallel \overline{FB}$	1. Given
2. $\overline{AC} \cong \overline{CB}$	2. Definition of Midpoint
3. ∢B ≅ ∢C	3. Corresponding Angles Postulate
4. ΔDAC ≅ ΔFCB	4. SAS
5. $\overline{DA} \cong \overline{CF}$	5. CPCTC

66.

Statements	Reasons
1. $\overline{EG}$ bisects $\overline{AB}$, $\overline{ED} \cong \overline{FD}$, $\overline{DB}$ bisects ∢FDG	1. Given
2. $\overline{AD} \cong \overline{DB}$	2. Definition of Bisect
3. ∢FDB ≅ ∢BDG	3. Definition of Bisect
4. ∢EDA ≅ ∢BDG	4. Vertical Angle Theorem
5. ∢FDB ≅ ∢EDA	5. Transitive Property
6. ΔEDA ≅ ΔFDB	6. SAS
7. ∢A ≅ ∢B	7. CPCTC

67. x = 25.7
    y = 22.9
68. x = 7
    y = 16
69. sometimes
70. never
71. sometimes
72. never
73. always
74. sometimes
75. always
76. never
77. sometimes
78. sometimes
79. always
80. sometimes
81. a) $\overline{AE}$
    b) $\overline{AH}$
    c) none
    d) $\overline{CE}$
    e) $\overline{AF}$
82. a) x = 6
    b) y = 20
    c) $\overline{MN}$ = 17
83. a) $\frac{2}{3}$
    b) $\frac{2}{3}$
    c) $\sqrt{13}$
    d) $\sqrt{52}$
    e) $\overline{DE}$ is a midsegment of ΔABC because it is both parallel to and half the length of $\overline{AB}$.
84. not equilateral
85. concave
86. not a polygon
87. convex

	Polygon	Sum of Interior Angles	Sum of Exterior Angles
88.	Heptagon	900°	360°
89.	Dodecagon	1800°	360°
90.	15-gon	2340°	360°

	Regular Polygon	Each Interior Angle	Each Exterior Angle
91.	Octagon	135°	45°
92.	Decagon	144°	36°
93.	20-gon	162°	18°

94. octagon
95. 36-gon
96. decagon
97. pentagon
98. 72-gon
99. nonagon
100. 158°
101. $\overline{LM}$ = 49
102. x = 0.5
103. x = 4
y = 24
104. x = 12
105. x = 10
106. x = 3