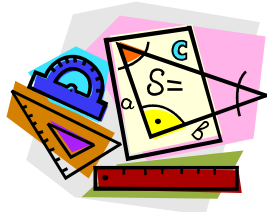# Honors Geometry – Semester Exam Review

- **GET ORGANIZED.** Successful studying begins with being organized. Bring this packet with you to class every day.

- **DO NOT FALL BEHIND.** Do the problems that are assigned every night and come to class prepared to ask about the things you could not do.

- **GET SERIOUS.** The grade you earn on this exam is worth **20% of your semester grade**.

- **MAKE NOTES AS YOU WORK.** As you do these problems, you will come across formulas, definitions, problems, and graphs that you will want to put on your notecard.

- **NOTECARD:** Your notecard must be in your own writing. You may put on it anything you think will help you on the exam. You may use the front and back. You will turn it in with your exam.

- There is nothing on the exam that you have not studied this year.

- You will turn in your review packet **before** you take your midterm.

- This packet is worth a **HUGE homework grade**. This grade is based on:
    - ✓ **Completion.** I will check each day to make sure that day's work is done.

    - ✓ **Correctness.** I will check random problems to make sure they are correct, or that you made corrections as needed.

    - ✓ **Participation**. I will keep track of people who ask questions, answer questions or put problems on the board. Everyone needs to participate at least twice.

Midterm Review Assignments

Assignment	DUE Date	☑

Semester 1 Exam – Review   Name:_____
**Honors Geometry**   Hour: _____

**Answer the following questions. Show ALL work.**

1. If $\triangle ABC \cong \triangle BAC$, then $\triangle ABC$ is:
    a. isosceles   b. equilateral   c. scalene   d. obtuse   e. nonexistent

2. Find the angle formed by the hands of a clock at 10:30.

3. Find the range of possible values for x below: 4. The measures of two complementary
                                                      angles are in the ratio of 4:11. Find the
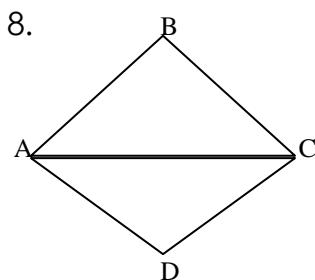   measure of the supplement of the smaller
                                                      angle.

6   x

8
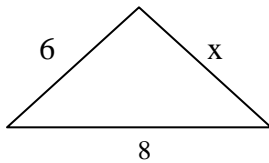
For 5-7 on the right, use the drawing below-
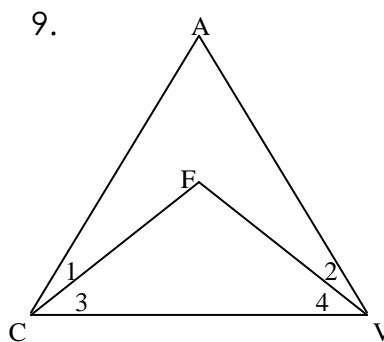**It is given that ABCD is a square with a side of length 6:**
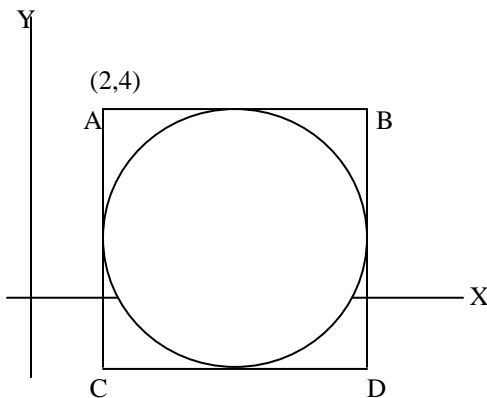
5. Find the coordinates of D

6. Find the exact area of the circle

7. If point A is reflected over the horizontal axis,
   find the coordinates of this reflected point

For 8-10, give a reason for each of the conclusions:

8.   9.   10.

Given: $\angle DCA$ is comp to $\angle BCA$ **Given:** $\overrightarrow{CF}$ & $\overrightarrow{VF}$ are angle bisectors
         $\angle BCA$ is comp to $\angle BAC$ $\angle VCA \cong \angle AVC$
Conclusion: $\angle DCA \cong \angle BAC$ **Conclusion:** $\angle 1 \cong \angle 4$ **Conclusion:** $\overline{AV} \cong \overline{AV}$
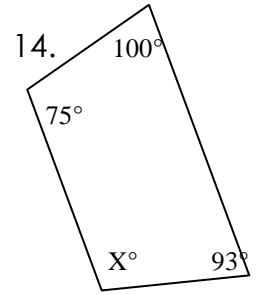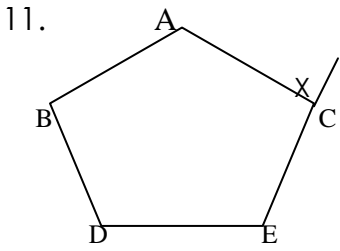
8. _____   9. _____   10. _____

For 11-21, find the value of X:
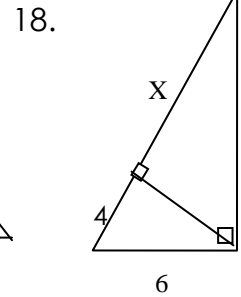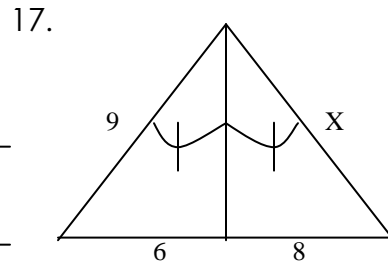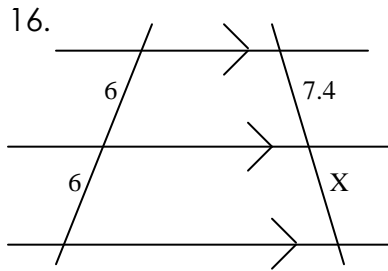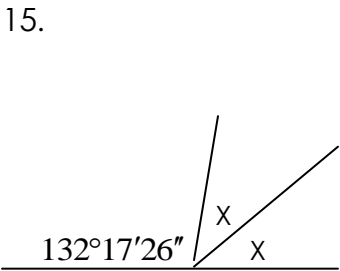
11.

12.

130°

13.

14.
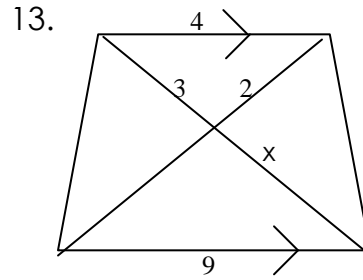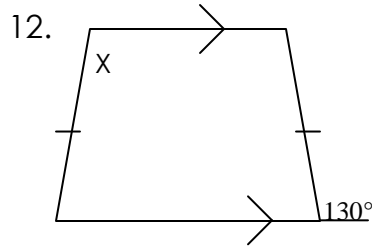
Given: ABCDE is a reg. pent.

11. _____

12. _____

13. _____

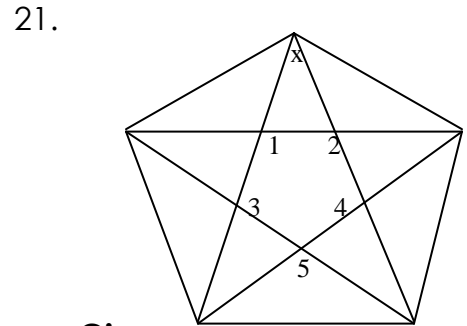14. _____

15.

132°17′26″   X

16.

6   7.4

6   X

17.

9   X

6   8

18.

X

4

6

15. _____

16. _____

17. _____

18. _____

19.

50°

X

130°

20.
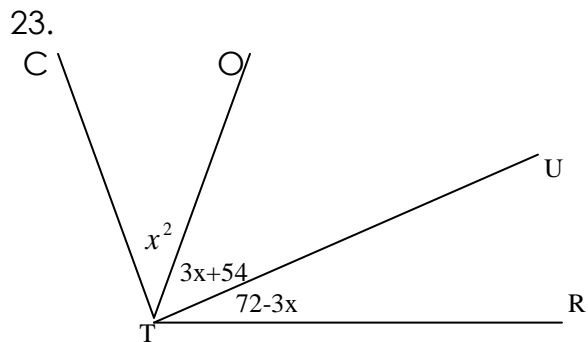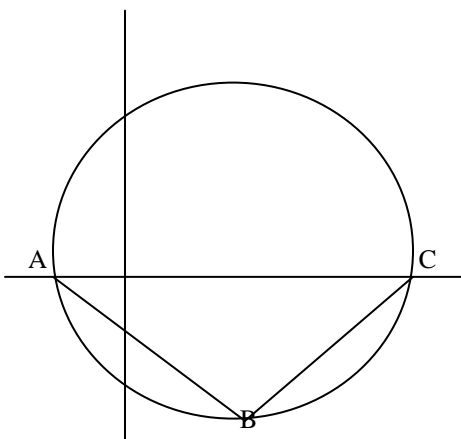

5

3

10

X

21.

Given:
∠'s 1-5 ≅

19. _____

20. _____
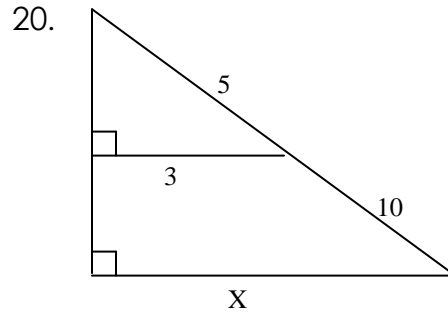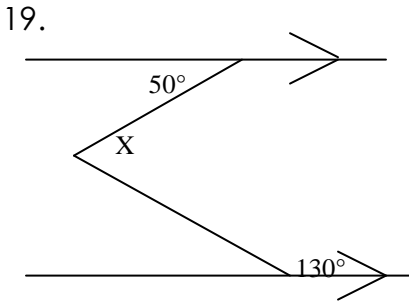
21. _____

22. **Given:** $\triangle ABC$ is inscribed to a circle at the points (-7,0), (11,-6), (13,0).
Is $\triangle ABC$ a right triangle?

23.

∠OTR is obtuse
∠CTU is acute
$\overrightarrow{TO}$ bisects ∠CTU
Can ∠UTR be a right angle? Justify.

For 24-28, choose the most descriptive answer.

A. parallelogram   *B. kite*   *C. rectangle*   *D. square*   *E. rhombus*

____24. If one diagonal of a quadrilateral bisects a pair of opposite angles, the quadrilateral is a __.

____ 25. If the consecutive sides of a rhombus are joined by their midpoints, the figure formed is a ___.

____ 26.If the figure would be a square except that it has oblique (non-$\cong$) diagonals, it must be a __.

____ 27. If opposite sides have equal slopes, the figure is a ____.

____ 28.If each diagonal divides the figure into two congruent isosceles triangles,then the figure is a_.

For 29 - 37, choose the best answer:

____ 29. $\overline{AB}$ is a segment in plane m, and $\overleftrightarrow{XY}$ is a perpendicular bisector of $\overline{AB}$.

Which must be true?

a. $\overleftrightarrow{XY} \parallel$ m   b. $\overleftrightarrow{XY} \perp$ m   c. If P is on $\overleftrightarrow{XY}$, then $\overline{PA} \cong \overline{PB}$ d. If $\overline{PA} \cong \overline{PB}$, then P is on $\overleftrightarrow{XY}$

____ 30. The supplement of an angle is 6 times the complement of the angle. Find the

supplement.   a. 70   b. 72   c. 8   d. 108   e. no supplement exists

____ 31. An angle is 4 times as great as its supplement. Find the measure of the complement

of the angle.   a. 36   b. 54   c. 72   d. 144   e. none

____ 32. Find the measure of each interior angle of an octagon.

a. 45   b. 60   c. 120   d. 135   e. insufficient information given

____ 33. Two sides of a $\triangle$ have lengths 6 & 8. Which of the following could not be the length

of the 3ʳᵈ side?   a. 2   b. 13   c. 8   d. 8.25   e. all are possible sides
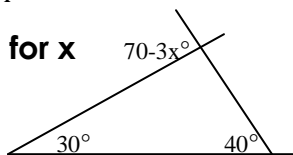
____ 34. The supplement of the complement of an angle is 132. What is the supplement of

the angle? a. 42   b. 31   c. 138   d. 222   e. no supplement exists

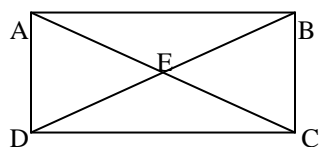____ 35. TRAM is a rhombus. Which of the following is not necessarily true?
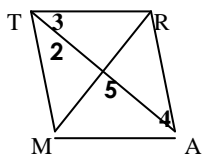
a. m$\angle$5 = 90   b. $\angle$2 $\cong$ $\angle$3   c. $\angle$2 $\cong$ $\angle$4

d. $\angle$5 > $\angle$4   e. All of the above are true

____ 36. **Solve for x**   70-3x°   a. 46$\dfrac{2}{3}$ b. $\dfrac{1}{3}$ c. 0   d. 70   e. impossible
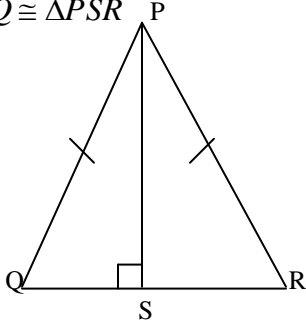
30°   40°

____ 37. **Given:** $\triangle DCE \cong \triangle BAE$ Which of the following is not necessarily true?

a. $\overleftrightarrow{AD}$ is parallel to $\overleftrightarrow{BC}$ b. $\overline{AB}$ is parallel to $\overleftrightarrow{DC}$

c. $\overline{AC}$ bisects $\overline{BD}$ d. E is the midpoint of $\overline{AC}$ e. a – d are true
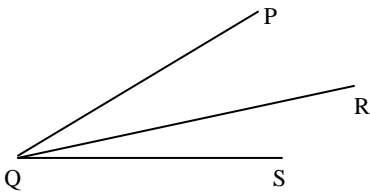
38. The measure of two consecutive angles of a parallelogram have a ratio of 11:1. Find the measure of the larger angle.

39. List all of the ways it could be proven that $\triangle PSQ \cong \triangle PSR$

40. The hour hand of a clock stopped, but the minute hand continued to move for 155 minutes. How many degrees would the hour hand have moved if it had not gotten stuck?
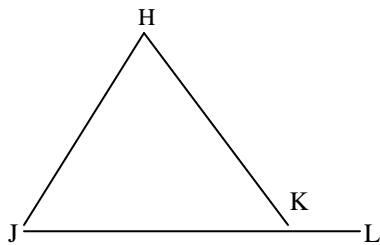
For 41-42, use the drawing on the left:

41. What is $\angle PQR \cap \angle RQS$? _____

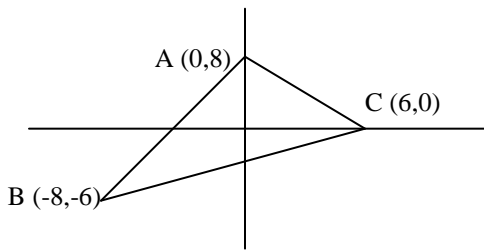42. What is $\overrightarrow{QR} \cup \overrightarrow{QS}$? _____

For 43-44, use the drawing on the left:

43. **Given:** The perimeter of $\triangle HJK$ is 42, $\angle J \cong \angle HKJ$ and HJ:JK = 3:4. Find JK = _____

44. **Given:** HJ = HK, m$\angle HKL$ = x + 50 and m$\angle H$ = x - 30 Find m$\angle H$ = _____
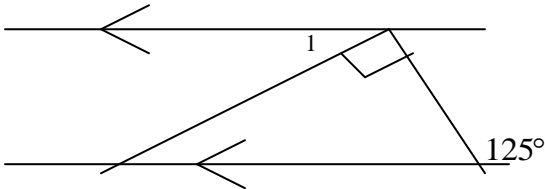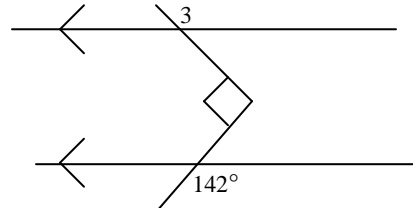
For 45-46, use the drawing on the left:

45. Find the midpoint of $\overline{BC}$ _____

46. Find the slope of the median to $\overline{BC}$ _____

47. Find the measure of $\angle 1$ _____

48. Find the measure of $\angle 3$ _____

49. **Given:** PRSQ is a quadrilateral
Plane m is parallel to Plane n
$\overline{PQ}$ is contained to Plane m
$\overline{RS}$ is contained to Plane n
$\overline{PR}$ is parallel to $\overline{QS}$
$m\angle QSR = 5x - 6 \,\&\, m\angle PRS = x + 12$, $m\angle PQS =$ _____

50. **Given:** $\triangle ABC \cong \triangle DEF$, DF = 10, AB = 18
Perimeter of $\triangle ABC$ = 40
Find DE + EF _____

For 51-65, write A for always, S for sometimes, or N for never

____ 51. If two angles are supplementary and congruent, they are right angles.

____ 52. The diagonals of a trapezoid bisect each other.

____ 53. If a triangle is equilateral, then it is equiangular.

____ 54. If a quadrilateral is equilateral, then it is equiangular.

____ 55. Definitions are reversible.

____ 56. In space, if two lines are parallel to the same line, then they are parallel to each other.

____ 57. A rhombus is a kite

____ 58. The perpendicular bisector of the base of an isosceles triangle bisects the vertex angle

____ 59. If a line is perpendicular to a plane, it is perpendicular to a line in that plane

____ 60. The measure of an exterior angle of a triangle is greater than every interior angle of the triangle.

____ 61. If the diags of a quadrilateral bisect each other & bisect the angles, the quadrilateral is a square.

____ 62. The median to the hypotenuse of a right triangle + average of the legs = half the triangle's perimeter.

____ 63. The sum of the diagonals of a rectangle is equal to the perimeter

____ 64. The sum of the complements of the three angles of a triangle is 90°

65. The sum of the measures of the angles of a regular polygon is 2880. Find the measure of each angle.

66. The sum of an angle plus its complement plus its supplement is 200 more than the angle. Find the measure of the supplement of the angle.
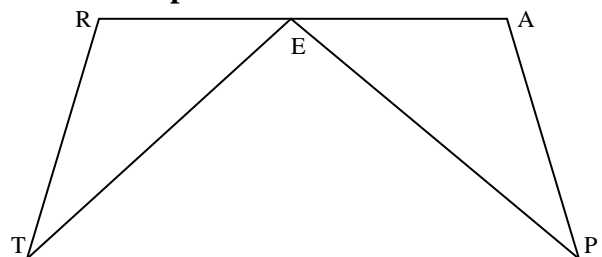
_____

_____

67. Name the polygon that has 54 diagonals.

68. A right triangle is determined by the x-axis, y-axis, and a line. If the line crosses the x-axis at (-7, 0), and the slope of the line is $\frac{2}{5}$, find the point where the line crosses the y- axis.

_____

_____

69. Given that the shape below is trapezoid, **find y**:
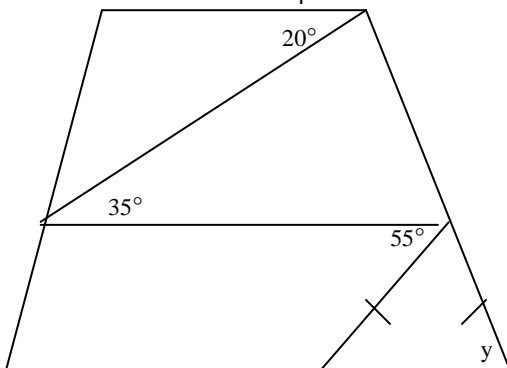
70. **Given**: $\overline{TP}$ is parallel to $\overline{RA}$, RA = 16
TP = 25, $\overrightarrow{TE}$ bisects $\angle RTP$,
$\overrightarrow{PE}$ bisects $\angle TPA$
Find the perimeter of TRAP

69. _____

70. _____

For 71, use the following vertices for $\triangle ABC$**: A = (3,1)   B = (-7,4) C = (-3,10)**

71. a. Find the slope of the median from A to $\overline{BC}$ b. Find the slope of the altitude from A to $\overline{BC}$
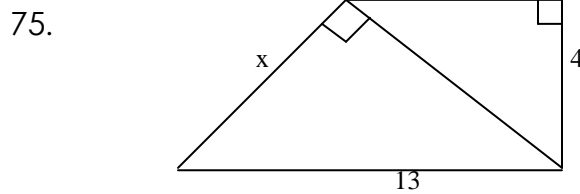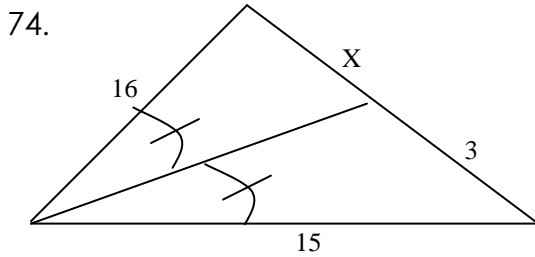
a. _____   b. _____

72. **Given**: SPQR is an isosceles trapezoid
        m $\angle S$ = x + 40
        m $\angle Q$ = 2x – 7

73. The sum of an angle and four times its complement is 20° greater than the supplement of the angle. Find the angle's complement.

72. **Find: m** $\angle R$ **= _____**
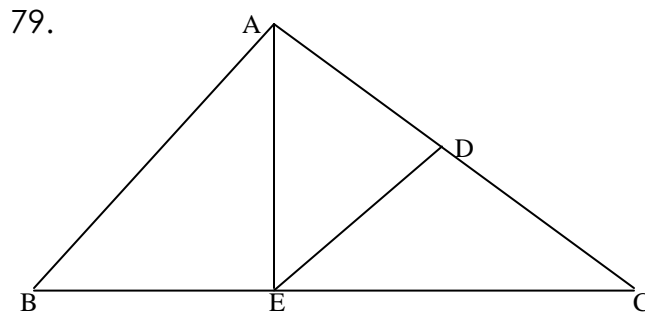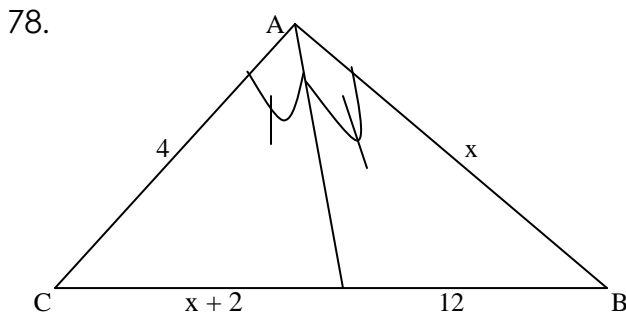
73. _____

74.

75.

74.   **X** = _____

75.   **X** = _____

76. a. Find the fourth proportional in a proportion whose first 3 terms are 5, 3 and 30.

    b. Find the mean proportionals between 8 & 18

77. The sum of the angles of an equiangular polygon is $3960°$. Find the measure of each exterior angle.

76. a. _____   b. _____

77. _____

78.

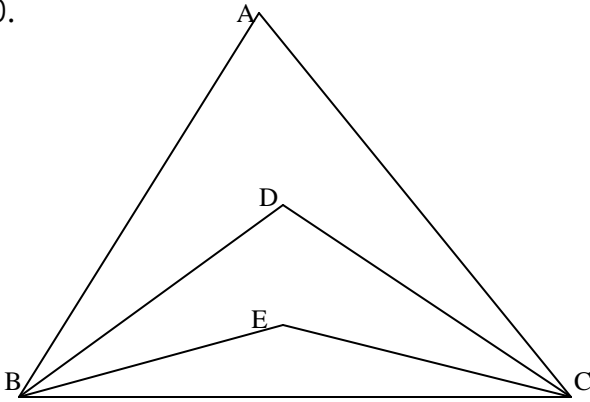
79.

Given: $\overline{BC}$ is the base of isosceles $\triangle ABC$
            $\overline{DE}$ is the base of isosceles $\triangle AED$
            $m\angle BAE = 40°$

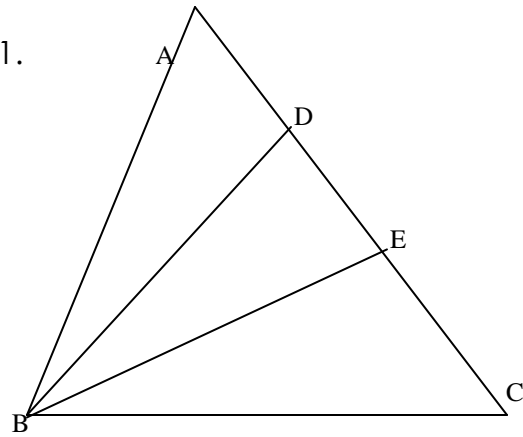78. **Find CB = _____**

79.   **Find** $m\angle DEC =$ _____

80.

Given: $m\angle A = 120$

$\overrightarrow{BD}$ & $\overrightarrow{BE}$ trisect $\angle ABC$

$\overrightarrow{CD}$ & $\overrightarrow{CE}$ trisect $\angle ACB$

Find $m\angle D =$ _____ & $m\angle E =$ _____

81.

Given: $\overrightarrow{BD}$ & $\overrightarrow{BE}$ trisect $\angle ABC$

DE = 4, EC = 5, BD = 12

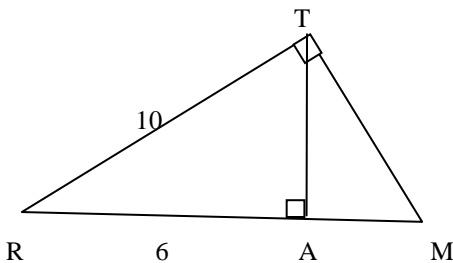**Find BC =** _____ **& BE =** _____ **& AD =** _____

82. Points (1,3), (-4, 7) and (-29, k) are collinear. Find k.

83. A pair of consecutive angles of a parallelogram are in the ratio 5 : 3. Find the measure of the smaller angle.

82. **k =** _____

83. _____

For 84-86, use the drawing on the left:

84. Find RM _____

85. Find AM _____

86. Find TA _____

For 87-89, use the drawing on the left:
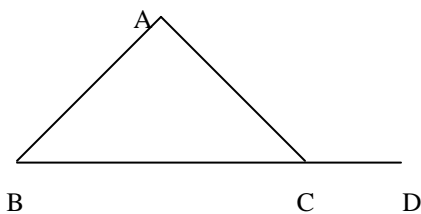
87. Given that $m\angle A = 40$, $m\angle B = 3x + 10$ and $m\angle ACD = 7x\text{-}30$, Find x _____

88. Given that $m\angle A = 4x$, $m\angle B = x + 45$ and $m\angle ACD = 8x\text{-}15$, Find $m\angle ACB =$ _____

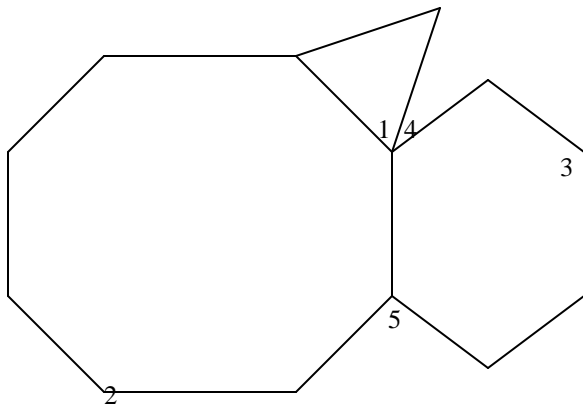89. In #87, is $\triangle CAB$ isosceles? _____ In #88? _____

90. The perimeter of an isosceles triangle is 36. One side is 10. What are the possible lengths of the base?

91. Find the number of sides of an equiangular polygon if each interior angle is $170°$.

90. _____

91. **n =** _____

For 92-96, use the drawing on the left, given that all three polygons are regular:

92. Find $m\angle 1 = $ _____

93. Find $m\angle 2 = $ _____

94. Find $m\angle 3 = $ _____

95. Find $m\angle 4 = $ _____

96. Find $m\angle 5 = $ _____

97. **Given:** GRAM is a parallelogram

98.
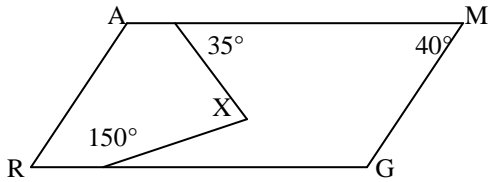
97. **X =** _____
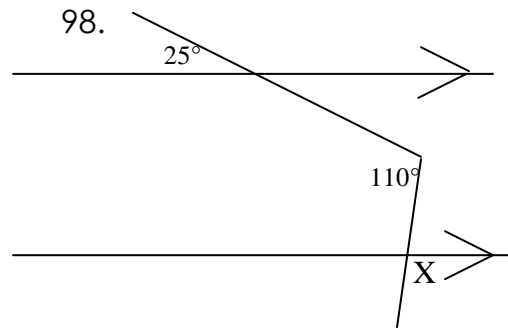
98. **X =** _____

99. Find the sum of the measures of the angles of a nonagon.

99. _____

100. If each angle of a regular polygon is $168°$, how many sides does it have?

100. _____

101. How many diagonals does a heptagon have?

101. _____

102. Find the mean proportionals between ¼ and 49.

102. _____

103. Solve $\dfrac{5}{5-y} = \dfrac{10}{y-10}$ for y.

103. _____

104. A woman walks 20 m west, 100 m south, another 8 m west and then 4 m north. How far is she from her starting point?

104. _____

Use the following drawing for 105-106:

105. **Given:** PS = 15, RS = 12, RQ = 6
           PQ = 16

    PT = _____

    TR = _____

106. **Given:** T and R are midpoints
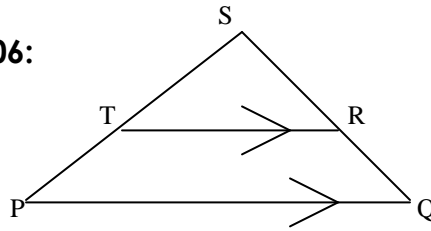   SR = 2, ST = 4, TR = 6

Find the perimeter of Quad PTRQ = _____

107.
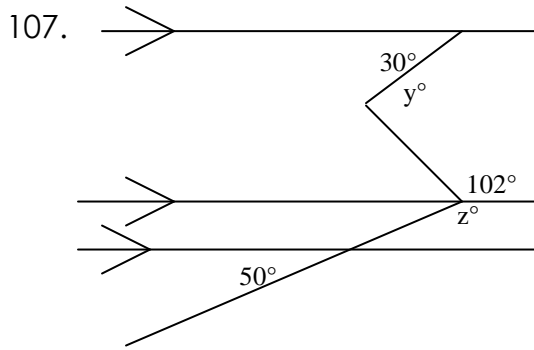
108. Find the measure of each angle.

107. y = _____ z = _____
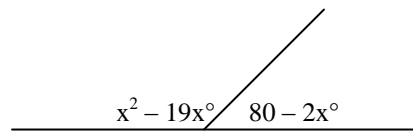
108. _____ & _____

109. Find the restrictions on x for $\triangle AMV$ to be
a triangle: *Hint* Triangle Inequality
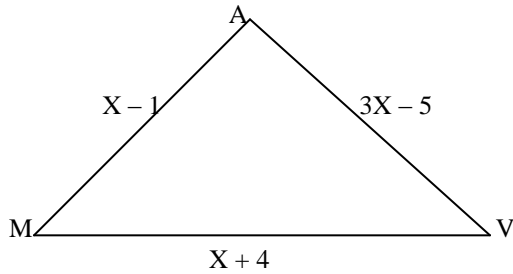
110.
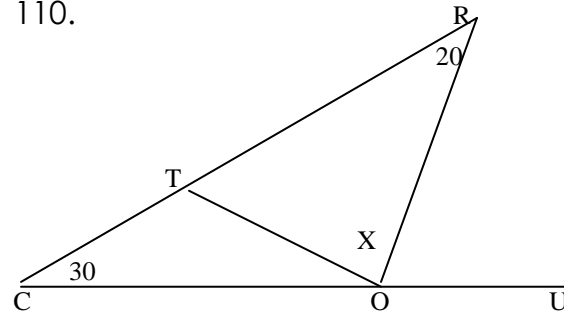
Given: $\angle COT \cong \angle ROU$
Find X

109. _____

110. **X** = _____

For 111-120, choose the best answer:

____111.
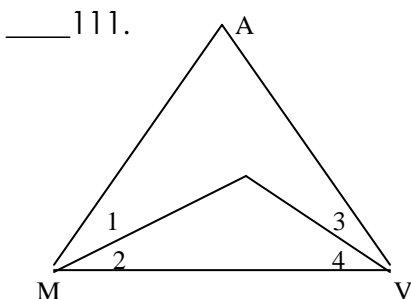
Given: $\angle AMV \cong \angle AVM$
      $\angle 1 \cong \angle 3$
Then $\angle 2 \cong \angle 4$ by:
    a. the Subtraction Property
    b. the Addition Property
    c. the Transitive Property
    d. the Division Property

_____ 112. Four angles of a pentagon each have measure of $100°$. The fifth angle measures:

a. $150°$ b. $140°$ c. $120°$ d. $108°$ e. $100°$

_____ 113. **Given:** In $\triangle ABC \& \triangle DEF$, $\overline{AB} \cong \overline{FE}$, $\overline{AC} \cong \overline{DF}$ & $\angle A \cong \angle F$. Which of the following are true?

a. $\triangle ABC \cong \triangle DEF$ b. $\triangle ABC \cong \triangle DFE$ c. $\triangle ABC \cong \triangle FED$ d. $\triangle ABC \cong \triangle EDF$ e. All of these

_____ 114. A quadrilateral must be a parallelogram if:

a. a diagonal separates the quadrilateral into two congruent triangles.   b. the diagonals are congruent
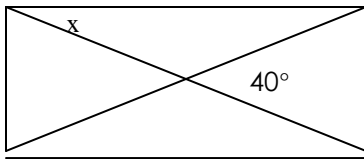
c. the diagonals are perpendicular   d. the diagonals are bisectors of each other.   e. it has four sides.

_____ 115. Five angles have measures $135°, 110°, 20°, 91°$ & $100°$. If 3 angles are selected at

random, find the probability that all three are obtuse.

a. $\dfrac{3}{5}$ b. $\dfrac{4}{5}$ c. $\dfrac{2}{5}$ d. $\dfrac{2}{3}$ e. $\dfrac{9}{10}$

_____ 116. Find x in the following rectangle.

a. $45°$ c. $70°$

b. $20°$ d. $60°$

_____ 117. Two opposite angles of an isosceles trapezoid are:

a. congruent   b. complementary   c. supplementary   d. vertical   e. not necessarily any of these

_____ 118. The diagonals are perpendicular and congruent in a(n):

a. rectangle b. kite   c. rhombus   d. square   e. isosceles trapezoid

_____ 119. Which of the following statements is NOT always true?

a. The diagonals of a rectangle are $\cong$ b. The diagonals of a rhombus are perpendicular bisectors

c. The diagonals of an isosceles trapezoid are $\cong$ d. The diagonals of a parallelogram bisect their angles

e. All of the above are true.

_____ 120. If diagonals of a parallelogram are congruent, the parallelogram must be a(n):

a. square   b. rhombus   c. rectangle d. isosceles trapezoid   e. kite

ANSWERS

1. a	31. E	61. S	91. 36
2. 135°	32. E	62. A	92. 60
3. 2 < x < 14	33. A	63. N	93. 135
4. 156°	34. C	64. S	94. 120
5. (8, -2)	35. E	65. 160°	95. 45
6. 9π	36. C	66. 145°	96. 105
7. (2, -4)	37. E	67. Dodecagon	97. 65
8. 2 angles are comp.	38. 165°	68. $2\frac{4}{5}$	98. 95
to the same angle	39. SAS, SSS		
9. Division	ASA, AAS, HL	69. 40	99. 1260°
10. Reflexive	40. 77.5°	70. 57	100. 30
11. 72	41. $\overrightarrow{QR}$	71. a. $-\frac{3}{4}$; b. $-\frac{2}{3}$	101. 14
12. 130	42. $\angle RQS$	72. 89 OR 91	102. $\pm\frac{7}{2}$
13. $\frac{27}{4}$	43. 16.8	73. 10°	103. $6\frac{2}{3}$
14. 92	44. 20	74. $\frac{16}{5}$	104. 100m
15. 23°51'17"	45. (-1, -3)	75. 12	105. 5 & $\frac{32}{3}$
16. 7.4	46. 11	76. a. 18 b. 12	106. 24
17. 12	47. 35	77. 15°	107. 108 & 130
18. 5	48. 128	78. 20	108. 150, 30 OR 92, 88
19. 100	49. 41	79. 20	109. $\frac{10}{3} < x < 8$
20. 9	50. 30	80. 140 & 160	110. 80
21. 36	51. A	81. 15 & $4\sqrt{10}$ & 4	111. A
22. Yes	52. N	82. 27	112. B
23. Yes	53. A	83. 67.5°	113. C
24. B	54. S	84. $16\frac{2}{3}$	114. D
25. C	55. A	85. $10\frac{2}{3}$	115. C
26. E	56. A	86. 8	116. B
27. A	57. A	87. 20	117. C
28. E	58. A	88. 35	118. D
29. C	59. S	89. Yes, No	119. D
30. D	60. S	90. 10 or 16	120. C