Summer Review For Students Going in the 8ᵗʰ Grade (Formula Sheet on last page)

Solve. Show you work when work should be shown.

1. $4n - 5 = 11$

2. $\dfrac{n}{2} + 3 = 9$

3. $12 = \dfrac{n}{-6} - 8$

4. $9n - 10n + 8 = -3$

For numbers 5 through 8, define the variable, translate each sentence into an equation, and then solve.

5. Five more than three times a number is 32. Remember to define your variable.

6. Ten less than three times a number is -1. Remember to define your variable.
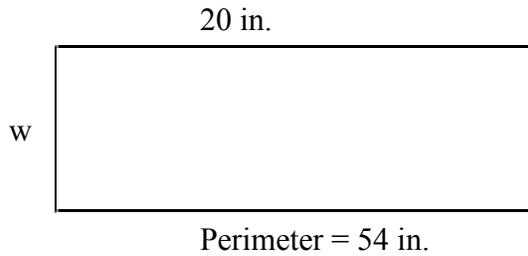
7. The quotient of a number and 4, increased by 5, is equal to 12. Define your variable.

8. The product of 4 and a number decreased by 7 is 29. Define your variable.

9.   a.) Find the perimeter, and b.) then find the area of the following rectangle. Show your work! $P = 2W + 2L$ and $A = LW$

4ft

10ft
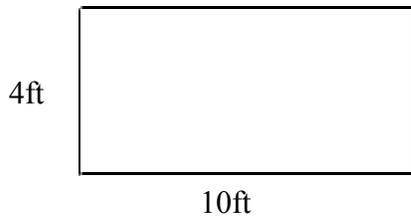
10. Find the missing dimension of the following rectangle.

20 in.

w

Perimeter = 54 in.

11. In the following 3 problems, choose between the associative, commutative and the distributive properties.

a.) $a + b = b + a$

b.) $a (b + c) = ab + ac$

c.) $(a + b) + c = a + (b + c)$

Simplify:

12. $4 \dfrac{1}{6} \cdot \dfrac{4}{5} - \dfrac{2}{3}$

13. $\dfrac{2}{3} + \dfrac{3}{7} \div 1 \dfrac{5}{7}$

14. $\dfrac{1}{5} \left(\dfrac{7}{2} \bullet \dfrac{4}{7} - \dfrac{11}{14} \right) + \dfrac{3}{14}$

15. a.) $-12 + (-3)$

b.) $18 + (-26)$

c.) $10 - (-9)$

d.) $-25 - 5$

16. a.) $-8 \, (-6)$

b.) $7 \, (-5)$

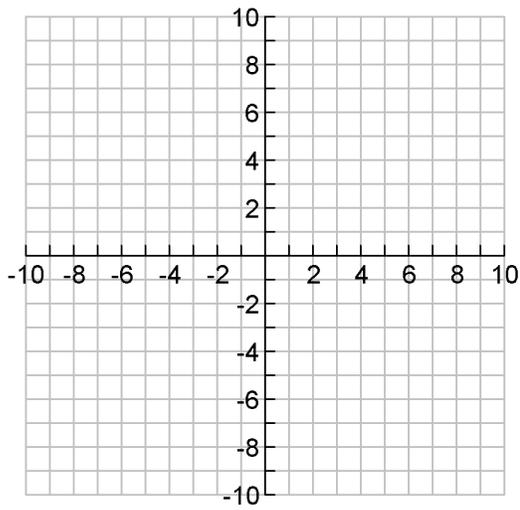c. $(-1) \, (4) \, (-3) \, (4) \, (-1)$

d. $(-3) \, (-5) \, (2) \, (-2) \, (-2)$

17. Given that 1000 m = 1 km, use unit multipliers to convert 8430 m to kilometers.

18. Use unit multipliers to convert 8430 km to meters.

19. Use unit multipliers to convert 4.19 km^2 to m^2.

20. Use unit multipliers to convert 96,100 m^2 to km^2.

21. Find at least 3 ordered pairs, and graph $4x + y = 7$ on a coordinate plane.

22. Use divisibility rules to determine whether each number is divisible by 2, 3, 5, 6, or 10.

a.) 57

b.) 378

c.) 118

d.) 250

23. List all the factors of 90.

24. Evaluate $2 (y - 3)^{2}$ if y = 6

25. In numbers 25 and 26, find the prime factorization of each set of numbers or monomials and then find the Greatest Common Factor (GCF) and the Least Common Multiple (LCM).

25. 135, 315

26. $30a^3b^2$, $24a^2b$

27. Factor each expression.

a.). $x^2 - 5x$

b). $48 + 8x$

28. Simplify each expression.

a.) $\dfrac{x}{x^6}$

b.) $\dfrac{10a^2}{40a}$

c.) $\dfrac{14a^2}{16a}$

d.) $\dfrac{3ab^3}{9a^4b}$

29. Find each product. Express using exponents.

a.) $2^3 \bullet 2^4$

b.) $x \bullet x^8$

c.) $(n^6)(n^3)$ d.) $-9x^9(5x^5)$

30. Find each quotient. Express using exponents.

a.) $\dfrac{5^{10}}{5^6}$ b.) $\dfrac{7^8}{7}$

c.) $\dfrac{x^{10}}{x^4}$ d.) $\dfrac{a^{20}}{a^{10}}$

31. Simplify: 2^{-3}

32. Evaluate $(ab)^{-3}$ if $a = 5$ and $b = 2$

33. Express each number in standard form.

a.) $9.18 \bullet 10^{-5}$ b.) $8.31 \bullet 10^6$

34. Express each number in scientific notation

a.) 700,000   b.) 0.0000902

35. Write $\dfrac{3}{8}$ as a decimal without using a calculator.

36. Find the mean, median and mode for the following data: 43, 41, 40, 37, 43, 36. You may use a calculator for the mean.

37. 36 is what % of 80? Show your work!

38. 56 is 28% of what number? Show your work!

39. 45% of 160 is what number? Show your work!

40. What is the percent of change from 25 to 36? Show your work!

41. What is the percent of change from 40 to 12? Show your work!

42. There are 4 blue marbles, 8 red marbles, and 10 green marbles in a bag. One marble is selected at random. Find the probability of pulling out a red marble. P(red) =

43. Solve. $\dfrac{18}{12} = \dfrac{24}{n}$

44. Solve: $N + \dfrac{3}{8} = \dfrac{5}{6}$

45. Solve: $\dfrac{5}{9} N = \dfrac{20}{21}$

46. Solve: 3n-12=7n

47. Solve: 8n -49 = n

48. Solve: 4 (n+1)=16

49. Solve: 4(n -5)=3(n+2)

50. Solve: 3n-4>17

51. Solve: 10-3n >19

52. Solve: 2(-2n - 3) - (-3n –4) = 7

$\dfrac{1}{8}$

53. Solve: $4\dfrac{3}{4}$ X + 1$\dfrac{1}{2}$ = 5

54. Find the slope of the line that passes through the following two points.
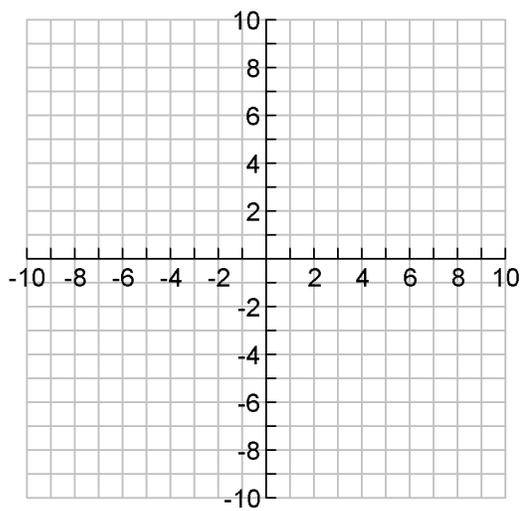C (7,3), D (-1,-4)

55. State the slope and the y-intercept and then graph Y = -4X + 1 on a coordinate plane.
The graph is on the top of the next page.
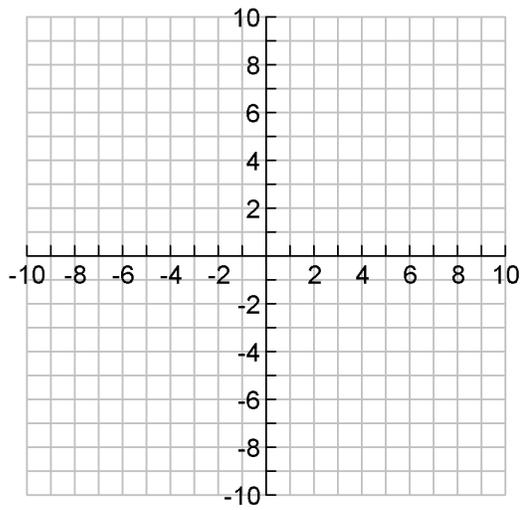
56. Solve the following system by graphing on a coordinate plane.
Y =2X + 4

Y = -X – 2

Complete the blanks for the following problems. Possible answers could be gotten from this list for some of these blanks. Acute, Associative, Commutative, Distributive, Equilateral, Integers, Irrational, Isosceles, Natural, Obtuse, Rational, Real, Right, Scalene, Similar, Straight, Counting

57. Triangles that have the same shape but not necessarily the same size are called _____ triangles.

58. _____ angles have measures greater than 90 degrees but less than 180 degrees.

59. A _____ number is any number that **cannot** be expressed as the quotient $\frac{a}{b}$ of 2 integers, a & b, where b ≠ 0. These numbers are not terminating or repeating.

60. The sum of the angles of a triangle is _____.

61. A _____ number is any number that can be expressed as the quotient $\frac{a}{b}$ of 2 integers, a & b, where b ≠ 0.

62. _____ angles have measures less than 90 degrees but greater than 0.

63. An _____ triangle has at least 2 sides congruent

64. _____ angles have measures of 180 degrees.

65. _____ numbers are the set of rational numbers and the set of irrational numbers.

66. An _____ triangle has all sides congruent.

67. _____ angles have measures of 90 degrees.

68. A _____ triangle has no congruent sides.

69. Find the value of x in the following triangle. Then classify the triangle as acute, right, or obtuse.
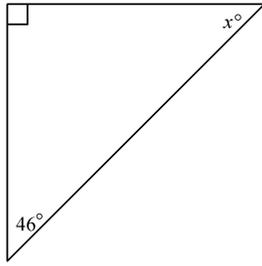
70..Using the Pythagorean theorem, what is the length of $\overline{CD}$ to the nearest tenth of a centimeter? You may use a calculator if necessary.
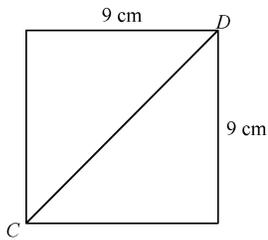

71. The top of a 10-foot ladder is placed against a wall so that it reaches the top of the wall. If the bottom of the ladder is 6 feet from the wall, how high is the wall? Using a calculator if you wish, round to the nearest tenth, if necessary. It may help to make a drawing.

72. Find the distance between J (5,-4) and K (-1,3). Round to the nearest tenth, and use a calculator if necessary.

73. The coordinates of the endpoints are C (-4,-9) and D (6,-5). Find the coordinates of the midpoint of the segment.

74. The triangles are similar. Write a proportion to find the missing measure. Then find the value of x.

A

60 in.

C   x in.   B

D

15 in.

F   10 in.   E
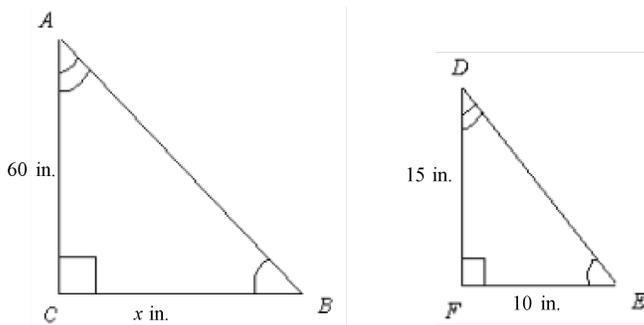
75. How far is it from *A* to *C*? The triangles are similar.
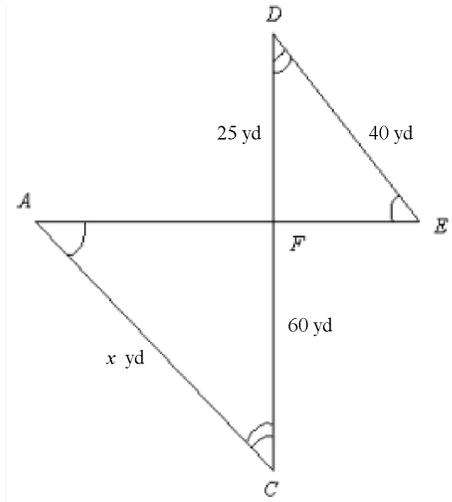
Natural #s (N) are 1, 2, 3, . . . (no fractions, decimals, negative #s or 0)
Whole #s (W) are 0, 1, 2, 3, . . . (no fractions, decimals, or negative #s)
Integers (Z) are whole numbers & their opposites (this includes negative #s)
Rational #s (Q) are numbers that can be written as a over b, where a & b are integers and b is not equal to 0. Repeating decimals can be written as fractions so they are rational #s.
Irrational #s (I) are numbers that **cannot** be written as a over b, where a & b are integers and b is not equal to 0. Numbers that continue forever but don't repeat like π & the square root of 2 are irrational #s.
Real #s are the set of rational & irrational #s.

76. Name all of the sets of numbers to which each real number belongs. Let N = natural numbers, W = whole numbers, Z = integers, Q = rational numbers, and I = irrational numbers.

a.) 8

b.) 0

c.) -8

d.) 0.12121212…
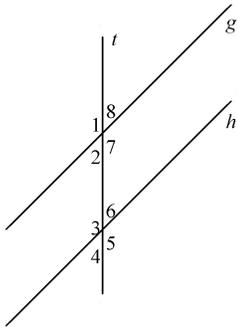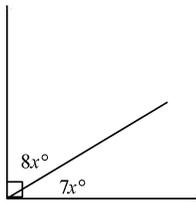
e.) 6.182576…

f.) $\dfrac{3}{4}$

g.) 9.12

h.) $\sqrt{10}$

77. In the figure below, $g \parallel h$ and t is a transversal. If angle 3 = 120 degrees, what is the measure of angles 1, 2, 4, 5, 6, 7 and 8?
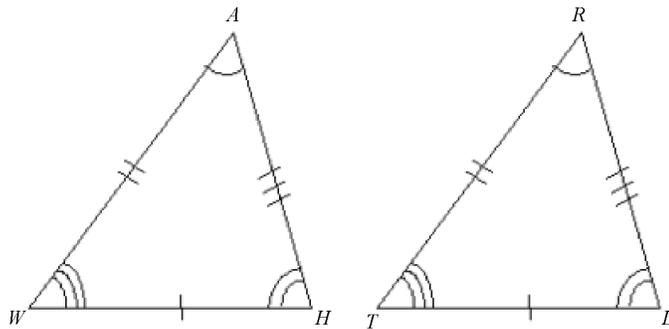
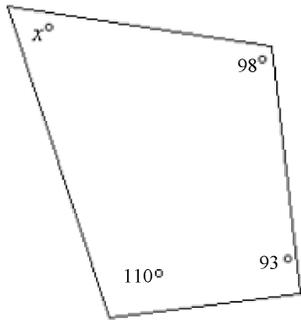78. Find the value of x. Then find the measure of each angle.

79. Angles V and W are complementary. If angle V = x-7 and angle W = x + 9, then what is the measure of each angle?

80. If $\angle X$ and $\angle Y$ are supplementary and angle Y = 3x + 6 and angle X = 5x-2, then what is the measure of each angle?
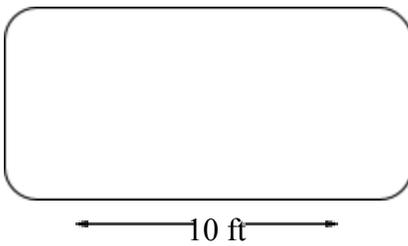

81.
Triangle RLT = Triangle_____

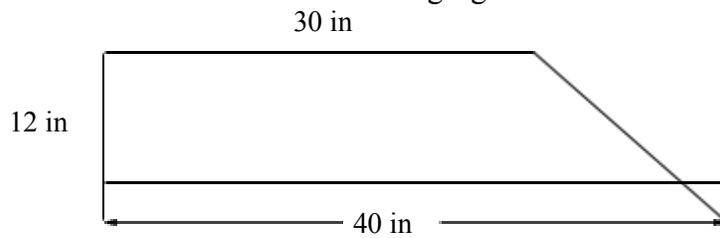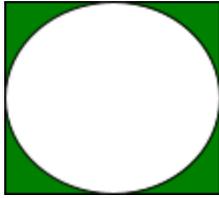82. Find the value of x.

$x°$
$98°$
$110°$
$93°$

83. Find the area of the figure to the nearest tenth, if necessary. The radius is 6 ft.
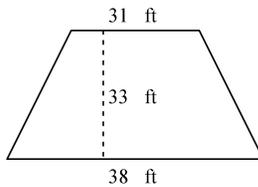

10 ft

84. Find the area of the following figure. The dimensions are in inches.
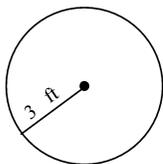
30 in

12 in

40 in

85. Find the area of the shaded region of the following figure. The radius is 6 inches, and round to the nearest tenth.

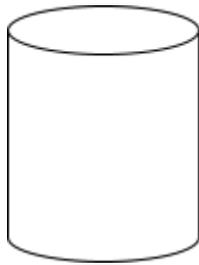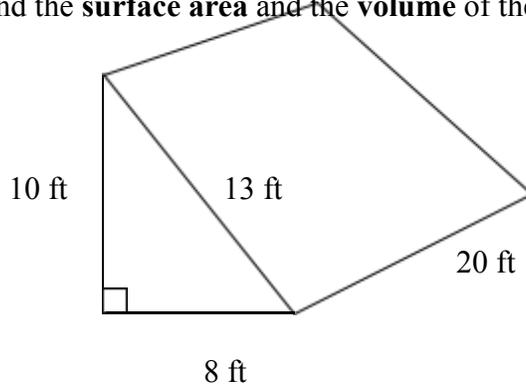86. Find the area of the following figure. Round to the nearest tenth.

31 ft

33 ft

38 ft

87. Find the **circumference** and the **area** of the following figure. Round to the nearest tenth.
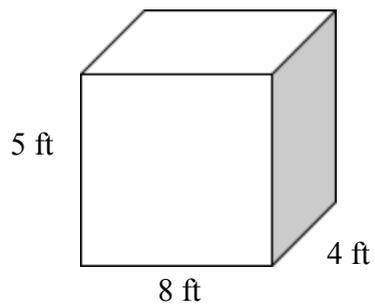

3 ft

88. Find the volume of the following cylinder. The radius is 5 meters, and the height is 20 meters. Round to the nearest tenth.

89. Find the **surface area** and the **volume** of the following figure

10 ft   13 ft

20 ft

8 ft

90. Find the **surface area** and the **volume** of the following figure.

5 ft

4 ft

8 ft

Formula Sheet

Perimeter (rectangle): 2W + 2L

Perimeter (circumference) of a semicircle : $\dfrac{\pi d}{2}$ or πr

Area (semicircle) : $\dfrac{\pi r^2}{2}$

Circumference of a circle: πd or $2\pi r$

Area of a circle: πr^2

Area of a triangle: $\dfrac{bh}{2}$ or $\dfrac{1}{2}bh$

Area of a rectangle: lw

Area of a trapezoid: $\dfrac{1}{2}h(b_1 + b_2)$

Volume: (Area of base) $\bullet$ (height)

Surface Area: sum of all the areas of the exposed surfaces

Pythagorean theorem $a^2 + b^2 = c^2$

Distance Formula between points (x_1, y_1) and (x_2, y_2) $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint Formula between two points (x_1, y_1) and $(x_2, y_2) = (\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2})$

% Change $= \dfrac{change}{original} \bullet 100$

slope of the line containing the points (x_1, y_1) and (x_2, y_2) $m = \dfrac{y_2 - y_1}{x_2 - x_1}$