The following Reference Sheet may be helpful.

ISAT MATHEMATICS REFERENCE SHEET
Grades 7 and 8

FORMULAS FOR PLANE FIGURES

Parallelogram: $A = bh$

Trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$

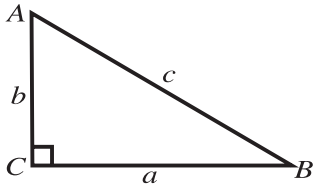
Triangle: $A = \frac{1}{2}bh$

Circle: $C = 2\pi r$

$A = \pi r^2$

Right Triangle:

The Pythagorean Formula
$c^2 = a^2 + b^2$



FORMULAS FOR SOLID FIGURES

Prism: $V = Bh$ (B is the area of the base.)

Right Cylinder: $V = \pi r^2 h$

Regular Pyramid: $V = \frac{1}{3}Bh$

Name: _____

C3

Seventh Grade Advanced Summer Packet

For Students Entering Algebra I or Integrated Math

Evaluate each expression. (NO CALCULATOR)

1) $7[8(3) \div (15 - 9)]$

2.) $8[(12 - 5) + 4]^2$

_____ _____

Find the product or quotient. Express using positive exponents.

3.) $4^{-5} \cdot 4^7$

4.) $\frac{y^{15}}{y^{-2}}$

_____ _____

5.) $(-n)^{-6} \div (-n)^4$

6.) $a^7 \cdot a^9$

_____ _____

Find the missing exponent.

7.) $(5^{?})(5^2) = 5^3$

8.) $\frac{c^{10}}{c^{?}} = c^{13}$

_____ _____

9.) **FIND THE ERROR:** Jason is multiplying $(4a^2)(4a^3)$. Find his error and correct it.

$$(4a^2)(4a^3) = 4a^{2+3}$$
$$= 4a^5$$

Order each set of numbers from least to greatest.

10.) 2.4×10^2, 2.45×10^{-2}, 2.45×10^2, 2.4×10^{-2}

_____

11.) 9,562,301; 9.05×10^{-6}; 9.5×10^6; 905,000

_____

Use the table below to answer the following questions.

12.) List the states in the table below from greatest to least production of maple syrup.

State	Amount of Syrup Produced (L)
Maine	1.10×10^6
New Hampshire	3.14×10^5
New York	9.65×10^5
Vermont	1.89×10^6
Wisconsin	3.79×10^5

13.) A sheet of gold leaf is approximately 1.25×10^{-5} centimeters thick.

a.) Write the value of the thickness in standard form. _____

b.) Use the formula V = lwh to find the volume in cubic meters of a sheet of gold leaf that is 2 meters wide and 5 meters long.

ANSWER: _____

Evaluate each expression. Express the result in scientific notation and standard form.

14.) $(5.32 \times 10^{8})(3.54 \times 10^{3})$

Scientific Notation: _____

Standard Form: _____

15.) $(0.159)(5.19 \times 10^{-3})$

Scientific Notation: _____

Standard Form: _____

16.) $\dfrac{4.97x10^{6}}{7.1x10^{-8}}$

Scientific Notation: _____

Standard Form: _____

17.) $\dfrac{(2.8x10^{-7})(14,000,000)}{3.92x10^{4}}$

Scientific Notation: _____

Standard Form: _____

18.) The diameter of Mars is about 7×10^6 meters. A standard table tennis ball is 0.04 meter in diameter. About how many times greater is the diameter of Mars than that of a table tennis ball.

ANSWER: _____

Estimate each root to the nearest integer.

19.) $\sqrt[3]{520}$ 20.) $-\sqrt{48}$ 21.) $\pm\sqrt{39}$ 22.) $\sqrt[3]{-636}$

_____ _____ _____ _____

Find each root.

23.) $\sqrt{16}$ 24.) $\sqrt[3]{-1000}$ 25.) $-\sqrt{100}$ 26.) $\sqrt[3]{512}$

_____ _____ _____ _____

Simplify.

27.) $(7x + 5) + (x + 2)$ 28.) $(-x + 3) + (-5x + 6)$

_____ _____

29.) $(-4x + 3) - (-x - 4)$ 30.) $(3x + 7) - (x - 2)$

_____ _____

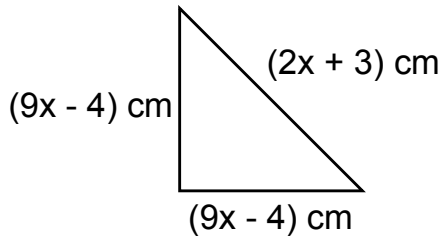
Simplify.

31.) $7 - 4(x + 3)$

32.) $3(2 + 3x) + 21x$

_____ _____

33.) Find the perimeter of the shape below. BOX YOUR ANSWER.



ANSWER: _____

Solve each equation. Round to the nearest tenth, if necessary. Check your solution.

BOX YOUR FINAL ANSWER.

34.) $p^3 = 1331$

35.) $n^2 = 64$

36.) $42 = 4x + 3x$

37.) $-7 - 8d = 17$

38.) $7.8 = 3 + 0.1n + 0.7n$

39.) $\frac{1}{3}p + 6 - \frac{2}{3}p = 0$

Solve each equation. Round to the nearest tenth, if necessary. Check your solution.

BOX YOUR FINAL ANSWER.

40.) $5(w + 1) = 25$

41.) $-2(b + 5) = 12$

42.) $x + 6 = 3x$

43.) $3 - 3.7b = 10.3b + 10$

44.) $8x - 4 = 2(4x - 2)$

45.) $9(x - 4) = 3(3x - 8) - 5$

46.) $8(3a + 6) = (2a - 4)$

47.) $-7(k + 9) = 9(k - 5) - 14k$

48.) **FIND THE ERROR:** Ali is solving the equation 10x + 6 = 8x – 4. Find her error and correct it.

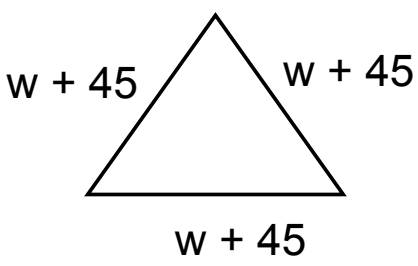
$$10x + 6 = 8x - 4$$
$$10x - 10x + 6 = 8x - 4 - 10x$$
$$6 = 4 - 2x$$
$$2 = -2x$$
$$-1 = x$$

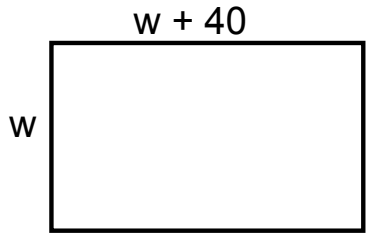
Solve.

49.) $6n - 18 \geq 4(n + 2.1)$

50.) $\frac{1}{4}x + 13 > 0.25(2x - 32)$

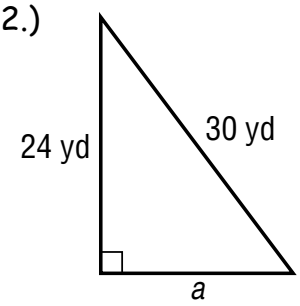
51.) Jamie is going to fence the rectangular and triangular sections of grass shown below. The perimeters of the two sections are now equal. If w represents the width of the rectangle, how could you find the lengths of the sides of the rectangle and of the triangle? Justify your response and use your method to solve the problem.





Write an equation you could use to find the length of the missing side of each right triangle. Then find the missing length. Round to the nearest tenth if necessary.

52.)



EQUATION: _____

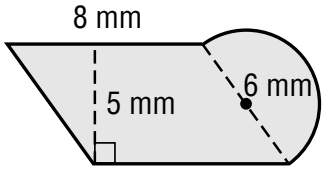
SOLUTION: _____

53.) What is the perimeter of a right triangle if the hypotenuse is 15 centimeters and one of the legs is 9 centimeters?

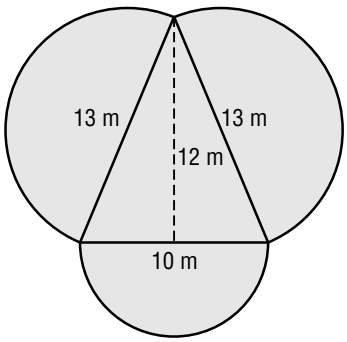
ANSWER: _____

Find the area of the following shapes. Include appropriate units and round your answer to the nearest tenth if necessary. SHOW ALL OF YOUR WORK!
(CALCULATOR ALLOWED)

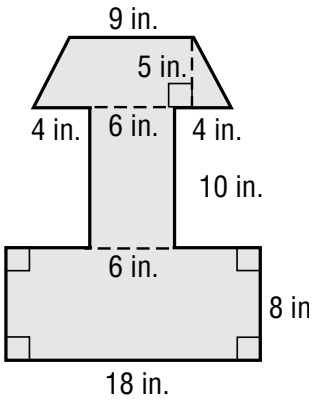
54.)



55.)



56.)



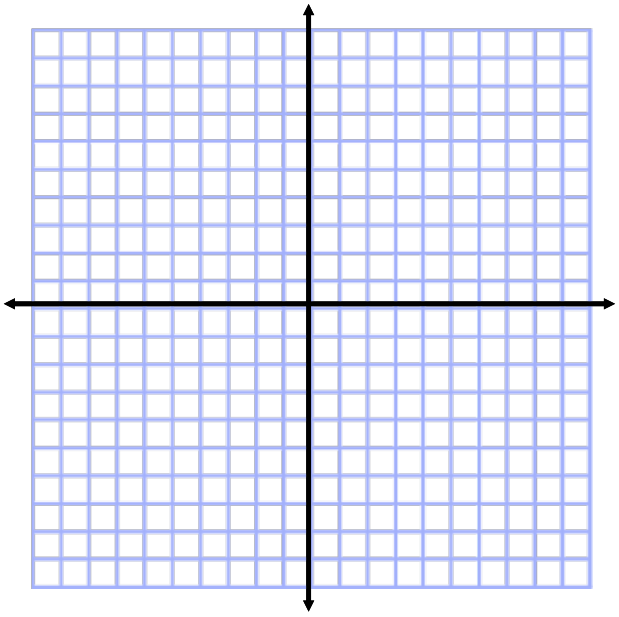
_____ _____ _____

State the slope and y-intercept and then graph each line.

57.) $y = \frac{3}{4}x - 1$

Slope: _____

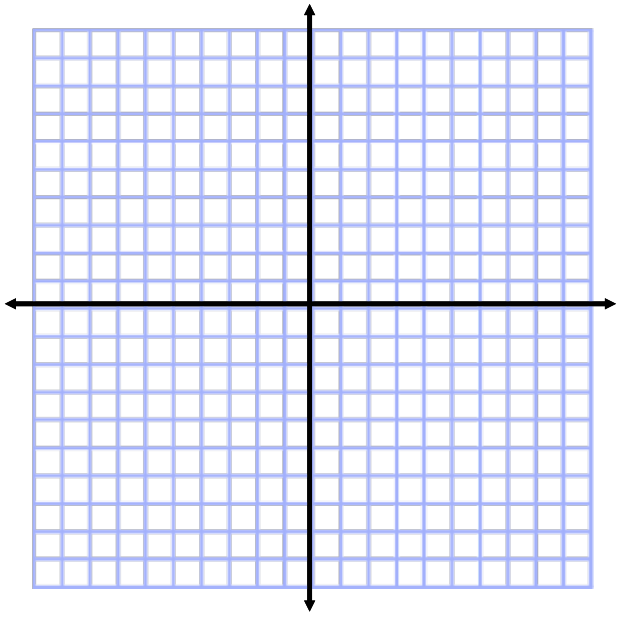
y-intercept: _____



58.) y = 5

Slope: _____

y-intercept: _____



Solve the system algebraically.

59.) $\begin{cases} y = 4 \\ y = 3x - 11 \end{cases}$

60.) $\begin{cases} 7x - 3y = -4 \\ 7x = -3 + 3y \end{cases}$

61.) $\begin{cases} 8y = 6 - 2x \\ x = 3 - 4y \end{cases}$