7B Pre-Algebra Summer Packet
For students entering 8th grade
Algebra in the fall

The summer math packet is comprised of important topics that you have studied this year, and will need to recall and use in the fall. Use your notes from the year, and any online reference as needed to refresh your memory. If you run into a question or two on a topic that we did not study in particular, use what you do know to try to work through it to the best of your ability.

Please work on the packet in small chunks throughout the summer, NOT IN ONE SITTING. Working in this way will best help you reinforce and retain the information that you learned this year.

After an in-class review of the packet questions, there will be a quiz on these topics during the first week of school in the fall. Working on this packet seriously will ensure retention of the topics learned, and a good start to the next school year.

Have a safe and wonderful summer!

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7B Pre-Algebra Summer Packet **Name: _____**
(students <u>entering</u> 8th grade Alegbra)

Evaluate the expression when $y = 24$ and $z = 8$.

1.) $\frac{y}{z}$

Evaluate the power.

2.) $(1.5)^4$

Evaluate the expression.

3.) $40 \div \left[(14 + 6) \bullet 2\right]$

Evaluate the expression when $r = 5$ and $s = 8$.

4.) $(r + 2)^2 - s$

Order the integers from least to greatest.

5.) −56, −102, 98, −58, 114

Find the sum.

6.) 23 + (−37) + 4

7.) What is the value of $5 - x - (-y)$ when $x = 7$ and $y = -2$?

Find the product or quotient.

8.) $-5(14)$

9.) $5\frac{8}{11} \div \left(-\frac{3}{4}\right)$

The following temperatures were taken during a week in December in Nome, Alaska. What is the mean temperature to the nearest degree?

10.) $-5°\text{F}, -8°\text{F}, -13°\text{F}, -16°\text{F}, -8°\text{F}, 11°\text{F}, 0°\text{F}$

Evaluate the expression using properties to lighten the work you show. <u>Name the property or properties used</u>.

11.) $(-15 \bullet 5) \bullet (-20)$

Multiply.

12.) $(2 - 12c)(-1)$

Simplify the expression.

13.) $5(n-1)-3n+6$

14.) $-\frac{18m^4}{7} \bullet \frac{14m^9}{24}$

15.) $\sqrt{\frac{7a^2}{28}}$

Solve the equation.

16.) $64 = -8a$

Solve the equation. Check your solution.

17.) $x + 12 = 9$

18.) $-2 = w - 19$

19.) $48 = -3y$

20.) $\frac{t}{31} = 14$

21.) $x + 5 = 2.7$

22.) $19z + 5 = -14$

23.) $7(12 - r) = -84$

24.) $7y + 11 - 12y = -19$

Divide.

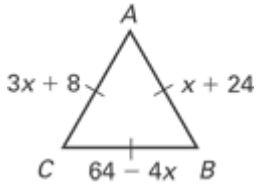
25.) $15.12 \div (-2.8)$

Write and solve an equation.

26.) A bookstore offers three books in a set for $21.75. Each book costs the same amount. How much does each book cost?

All three sides of the triangle have equal length. What is the perimeter?

27.)



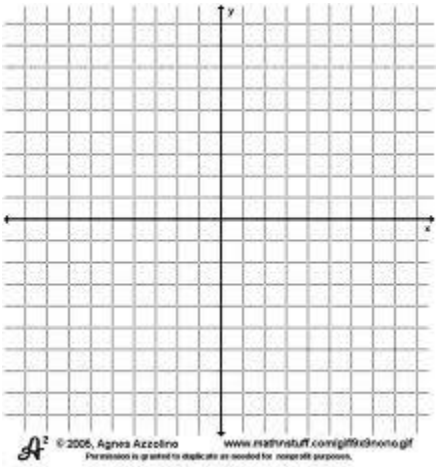
Solve the inequality, and graph the solution set on a number line.

28.) $5 > \frac{a}{-2}$

29.) You are selling magazine subscriptions for a school fundraiser. If you sell at least 75 subscriptions in 2 weeks you win a prize. You sold 26 subscriptions in one week. What is the mean number of subscriptions you have to sell per day to sell at least 75 total?

Plot the points listed below in the same coordinate plane. Describe any pattern you see in the graph.

30.) (−3,−4), (−2,−2), (−1, 0), (0, 2), (1, 4), (2, 6)



For the given expression, identify the terms, like terms, coefficients, and constant terms. Then simplify the expression.

31.) $x + 5 - 9 - 7x$

Terms:
Like Terms:
Coefficients:
Constants:
Simplified Expression:

Solve the inequality. Then graph the solution on a number line.

32.) $y + 5 > 3$

33.) $n - 4 \leq 0$

34.) $w - 4(w + 5) < -8$

35.) $9c - 8 \leq 3c + 16$

Use the fact that $\Delta TOP \cong \Delta LID$ to complete the statement.

36.) $\angle T \cong$ ___ ?

Find all the <u>factors</u> of the number.

37.) 84

Write the prime factorization of the number. Write the result in exponent form if any factors repeat.

38.) 84

Find the greatest common factor of the monomials.

39.) $12a^2, 18ab$

Write the fraction in simplest form.

40.) $\frac{32a^2}{36a^3}$

41.) One serving of rice pilaf has 220 calories, including 35 calories from fat. One serving of soup has 70 calories, including 15 calories from fat. Write the calories from fat as a fraction of the total calories for each food. Which food has a greater fraction of calories from fat?

Find the least common multiple of the monomials.

42.) $5x^2y,\ 21xy^3$

Find the product or quotient. Write your answer using exponents.

43.) $5n^7 \bullet 6n$

44.) $\dfrac{2x^4 \bullet 6x^7}{21x^3}$

Simplify. Write the expression using only positive exponents.

45.) $c^{-1} \bullet c^{-7}$

46.) Write 0.000872 in scientific notation.

Write the product in scientific notation.

47.) $(8.1 \times 10^4)(9.2 \times 10^8)$

48.) Write the decimal 0.375 as a <u>fraction</u> in simplest form.

Order the numbers from least to greatest.

49.) $2\frac{3}{10}$, $\frac{11}{5}$, 2.32, $\frac{5}{2}$, 2.25, 2

50.) A quarter's width is about $\frac{15}{16}$ inch. A dime's width is about $\frac{11}{16}$ inch. How much wider is a quarter?

Find the sum or difference.

51.) $\frac{5v}{3} + \frac{4v}{5}$

52.) $(-7z^3 + z^2 - 5) - (z^3 - 3z^2 + 1)$

53.) You have hiked $2\frac{1}{10}$ miles of a 5 mile trail. How much farther must you hike?

Solve the equation.

54.) $\frac{1}{4}x - \frac{5}{6} = \frac{11}{12}$

Solve the equation or inequality by first clearing the fractions or decimals.

55.) $\frac{2}{3} - \frac{5}{2}k \geq \frac{17}{30}$

56.) $-11 = 8.22w - 63.608$

Write the equivalent rate.

57.) $\frac{286.8\text{ m}}{\text{min}} = \frac{?\text{ m}}{\text{sec}}$

Write the rate as a unit rate.

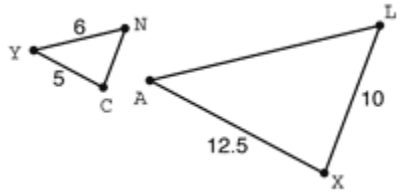
58.) $\frac{448\text{ cycles}}{5\text{ days}}$

Solve the proportion.

59.) $\frac{48}{36} = \frac{x}{6}$

60.) $\frac{t-3}{12} = \frac{5}{8}$

Use the triangles for the question below. Note that $\Delta NYC \sim \Delta LAX$.



61.) Find the measures of *NC* and *LA* In the triangles above.

62.) A 20 foot flagpole stands beside a building. The flagpole casts a shadow that is 25 feet long. At the same time, the building casts a shadow that is 60 feet long. How tall is the building?

63.) The scale drawing of a rectangular park has a scale factor of 1 cm to 74 m. The drawing is 11 cm by 18 cm. What are the actual dimensions of the park?

Write the percent as a <u>decimal</u> and as a <u>fraction</u>.
64.) 8%

Use a proportion to answer the question.
65.) 44 is what percent of 80?

Write the fraction as a <u>percent</u>.
66.) $\frac{7}{18}$

Write the decimal as a <u>percent</u>.
67.) 2.07

68.) In a survey, 34%, or 102 people, said they enjoy in-line skating. How many people were surveyed? Use a proportion to answer the question.

Use the percent equation to answer the question.

69.) What number is 0.7% of 60?

70.) A crowd of 280 people grows to a crowd of 315 people. What is the percent of increase?

Find the new amount.

71.) Decrease 650 by 21%.

72.) An item with a wholesale price of $8.40 is marked up 60%. What is the retail price?

Use the given information to find the new amount.

73.) Food bill: $38
Sales tax: 5%
Total Bill: _____

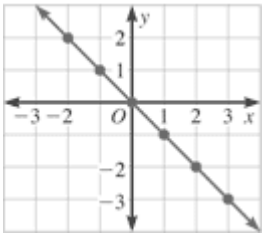
74.) You deposit $1350 into a savings account that pays a simple annual interest rate of 2.8%. How much interest will you earn in 15 months?

SHOW whether the ordered pair is a solution of the equation $12x + 3y = 21$.

75.) (2,–15)

Write the coordinates of two points on the line. Then find the slope of the line.

76.)



77.) Write an equation of a line that is perpendicular to $y = -2x + 6$ and passes through (–4, 7).

Write a linear function that satisfies the given conditions.

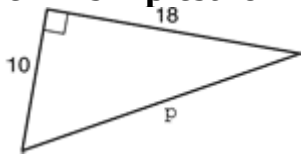
78.) $f(0) = -2,\ f(18) = 4$

Solve the equation. Round to the nearest tenth if necessary.

79.) $102 = 3k^2$

Find the unknown length using the Pythagorean Theorem. Write your answer in simplest form.

80.)

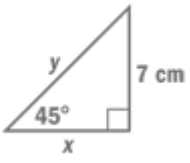


Determine whether the triangle with the given side lengths is a right triangle.

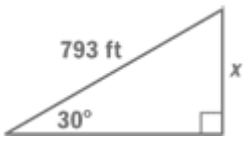
81.) 28, 96, 100

82.) Find the distance between points $A(-6,-2)$ and $B(-4, 1)$, and find the midpoint M of $\overline{AB}$.

Find the value of each variable in the 45, 45, 90 degree special triangle below.

83.) 

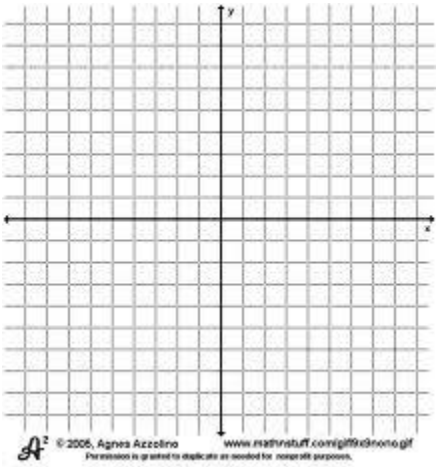
In the 1870s, a motorized incline was built in Pittsburgh, PA, to climb the steep hill known as Mt.Washington located at the mouth of the Monongahela River. The track of the incline is 793 feet long and makes a 30° angle with the ground. Find the height of the boarding platform at the top of the incline. (see triangle below)

84.) 

Graph the relation. Then tell whether the relation is a function.

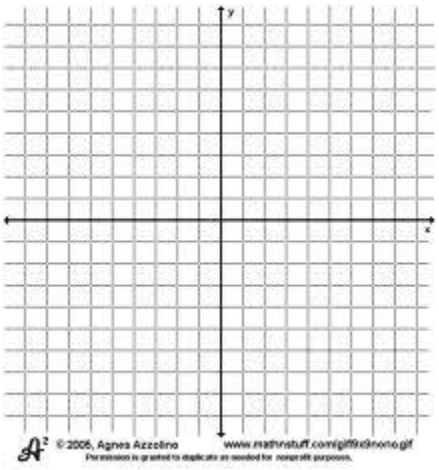
85.)

x	–4	–2	0	2	4
y	–1	0	1	2	3



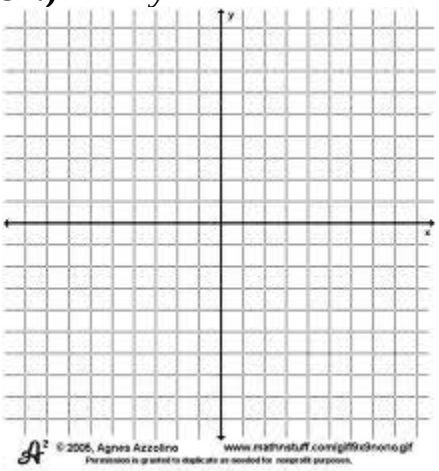
Graph the linear equation.

86.) $y = 8$



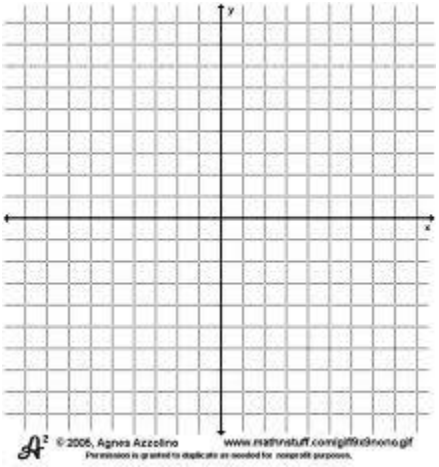
Name the *x*- and *y*-intercepts. Then graph the line using the intercepts.

87.) $2x + y = 4$



Find the slope and the *y*-intercept of the graph of the equation. Then graph the equation using the slope and y-intercept.

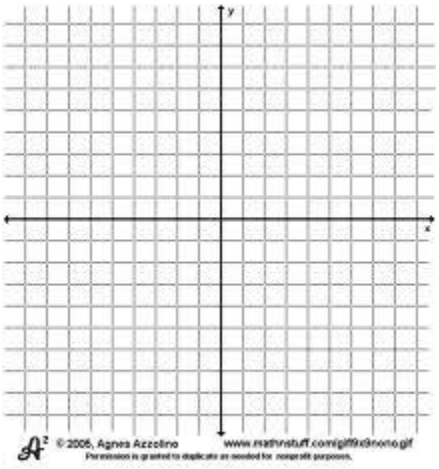
88.) $y = -\frac{1}{4}x$



Solve the linear system by graphing.

89.) $5x - 2y = 4$

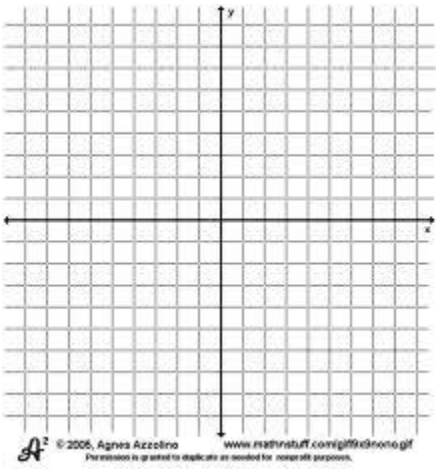
$-x + 4y = -8$



Solve the linear system by graphing.

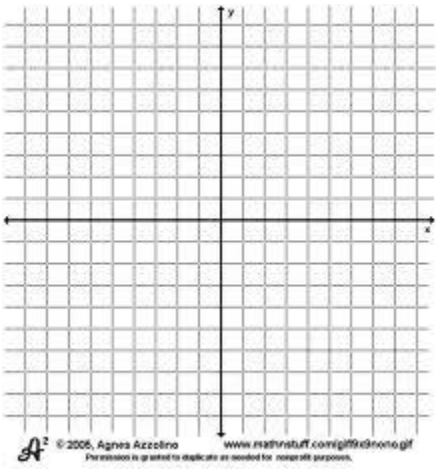
90.) $2x - y = 4$

$-2x + y = 4$



Graph the inequality in a coordinate plane.

91.) $3x - 7y \geq 21$



Complete the statement with <, >, or =.

92.) -11 __?__ $-\sqrt{11}$

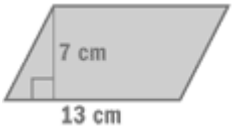
The measures of two angles of a triangle are given. Tell whether the triangle is *acute, right,* or *obtuse*.

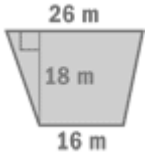
93.) $54°, 36°$

Decide whether the figure is a polygon. If it is, name it.

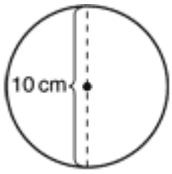
94.) 

Find the area of the parallelogram and trapezoid.

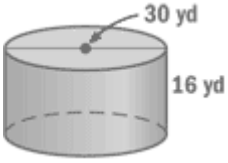
95.) 

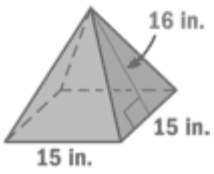
96.) 

Find the circumference and area of the circle. Use 3.14 for π.

97.) 

Find the surface area of the solid. Round to the nearest tenth.

98.) 

99.) 

Simplify the polynomial and write it in standard form.

100.) $-y + 6(y^2 - y^3 + 1)$

Find the product and simplify.

101.) $7n(n^2 - 2n)$

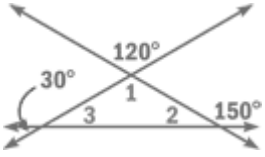
Simplify the expression. Write your answer using positive exponents.

102.) $(x^4)^{-3}$

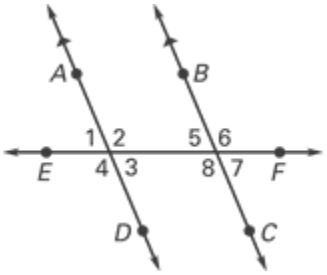
Tell whether the sequence is *arithmetic* or *geometric*. Then find the common difference or the common ratio, and write the next three terms.

103.) 1,–4, 16,–64, ...

Find the measures of the numbered angles.

104.) 

$\overleftrightarrow{AD} \parallel \overleftrightarrow{BD}$, and $m\angle 7 = 113°$.

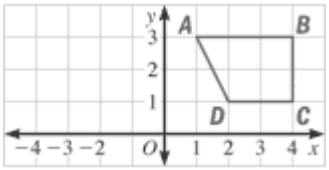


105.) Which angle forms a pair of alternate interior angles with $\angle 3$ in the figure above? What is the measure of this angle?

Graph the image of the given transformation.

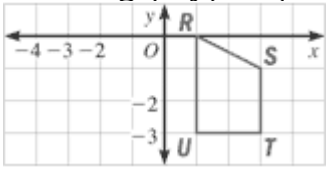
Rotate 180°

106.)



Translate using $(x, y) \rightarrow (x - 5, y + 3)$.

107.)



108.) A polygon has vertices A (−2, 0), B (−2, 4), C (−6, 8), and D (−12, 6). Dilate it using a scale factor of 2. Find the vertices of the image.