SHOSHI LEVY

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

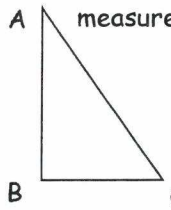
WEEK 1

1. Write the slope-intercept form of an equation of a line with a slope of $\frac{7}{11}$, and a y-intercept of -3.	2. Write a definition of slope.
3. You want to place a buried treasure chest halfway between a tree at (25, 175) and a large boulder at (200, 75). Use the midpoint formula to find the coordinates of the treasure chest. $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$	4. Solve for x: $\frac{x}{x+4} = \frac{2}{x}$
5. Use the FOIL pattern to multiply $(4x - 2)(x + 3)$.	6. Simplify using exponent rules: $(6x^3)(2x)^3$
7. Graph the linear system to determine the number of solutions. $3x + y = 6$ $-x - \frac{1}{3}y = -2$	8. Draw a line with the given slope: a) positive b) negative c) zero d) undefined
9. Solve for r: $r - 8 = 7$	10. Write an equation of the line that passes through (−8, 9) and (10, −3).

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

WEEK 2

1. Given triangle ABC. The measure of angle A is x, the measure of angle B is three times as much as the measure of angle A, and the measure of angle C is twice as much as the measure of angle A. Find the measure of each angle if the sum of the measures of the three angles is 180° .



2. Evaluate the expressions if m = 2, n = $\frac{1}{2}$, and p = $\frac{-2}{3}$ without a calculator

   a) pn – m

   b) $\frac{-1}{4}m^2$

3. The following table shows the relationship between dog years and human years.

Dog Years	Human Years
1	15
2	24
3	28
4	32
5	37
6	42

   a) Draw a scatter plot. Set up an appropriate scale and label your axes.
   b) Draw the line that best fits the data.
   c) Find the equation of the line.

4. Rewrite each expression in simplest radical form:

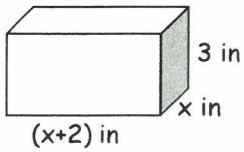
   a) $\sqrt[3]{125}$

   b) $\sqrt[3]{16}$

   c) $\sqrt{49x^2}$

   d) $\sqrt{50x^6y}$

5. The lengths of the sides of a rectangular prism are shown below. Write a polynomial expression for the volume. (V=lwh).



6. Find the equation of the line through the points (–1, 1) and (0, 2) in slope-intercept form.

7. Describe the line through the point (1, 4) with the slope m = 0. Write the equation of the line.

8. Solve for L: P = 2L + 2W

9. Factor completely: $5x^2 - 125$

10. Find an equation of the line parallel to 4x + 3y = 9 that passes through the point (10, 5).

    (Hint: Parallel Lines have the same slope.)

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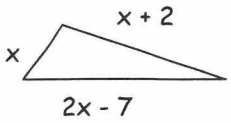
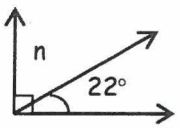
WEEK 3

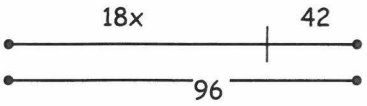
1. Find the length of the shortest side given that the perimeter is 31 inches.



2. The sum of two complementary angles is 90°. The picture below represents two complementary angles. Set up an equation and solve for the value of n.



3. Write an equation to represent the diagram. Solve the equation to find x.



4. Solve the linear system:

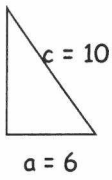
$x + y = 5$

$2x + y = 8$

5. At 2:15, a parachutist is 4500 ft. above the ground. At 2:28, she is 2200 ft. above the ground. Find the average rate of change in feet per minute.

6. Graph the quadratic equation $y = x^2 - 2x - 3$. Label the coordinates of the vertex, y-intercept, and x-intercepts.

7. A 10-foot ladder is leaning against a wall. If the base of the ladder is 6 feet from the wall, how high does the ladder reach up the wall?
(Hint: The Pythagorean Theorem is $a^2 + b^2 = c^2$)



8. Multiply $(2x + 5)(3x - 4)$.

9. A six-foot man casts a 5-foot shadow. If a tree casts a 40-foot shadow, how tall is the tree?

10. What mistake was made when this problem was solved?

$$\begin{array}{rcl} 3 - 2x & = & -15 \\ -3 & & -3 \\ \frac{2x}{2} & = & \frac{-18}{2} \\ x & = & -9 \end{array}$$

What should be the correct answer?

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WEEK 4

1. Write an algebraic expression for each:

   a) Five less than twice a number

   b) A number divided by six

   a) Three times a number less 5

2. The table shows the number of students each year at your high school.

   (You may use the regression feature on a graphing calculator instead of completing parts a and b, if you prefer).

   a) Construct a scatter plot. Set up an appropriate scale and label your axes. Let t = 0 represent 1990.
   b) Draw the line that best fits the data.
   c) Write the equation of the line that best fits the data.
   d) How many students would you expect there to have been in the year 2000?

Year	# Students
1990	1000
1992	1125
1994	1275
1996	1350

3. Graph the linear equation $3x + y = 6$ using the x- and y-intercepts.

4. Which fraction is equivalent to $\frac{T+N}{N}$?

   a) $\frac{T}{N} + N$ b) T

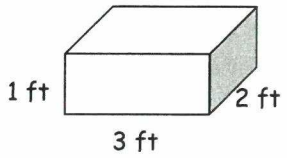
   c) $\frac{T}{N} + 1$ d) $T^2 + 1$

5. Solve the linear system by linear combinations:

   $4x + 5y = 7$

   $6x - 2y = -18$

6. Find the surface area and the volume of the figure. (S.A.= 2(lw+lh+wh) and V=lwh)

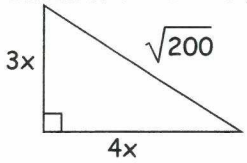


7. A jacket costs $89 plus tax. The total cost, C, is given by the equation $89 + 89t = C$, where t is the tax rate. Solve the equation for t.

8. What is the next number in the sequence?

   1, 5, 9, 13, ...

9. Find x. (Remember $a^2 + b^2 = c^2$)



10. Write the equation of the line in slope-intercept form if $(3, \frac{1}{2})$ and $(-4, \frac{-3}{2})$ are points on the line.

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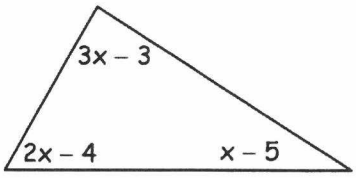
WEEK 5

1. The following quadratic model describes the path of a certain basketball in motion. The balls' height (in feet) is a function of time in flight (in seconds), modeled by the equation: $h = -16t^2 + 36t + 4$

   After how many seconds would the basketball's height be 12 feet? Round your answer to the nearest hundredth of a second.

2. The sum of the measures of the three angles in a triangle is 180°. Write an equation and solve for x.

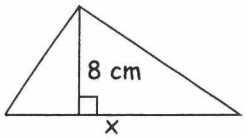


3. Solve the inequality for x:

   $-3 < 2x - 1$.

4. Solve the literal equation for x: $z = \frac{x - m}{s}$

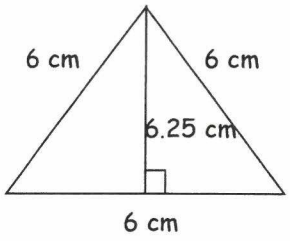
5. The area of the triangle is 36 square centimeters. Find the length of the base x. ($A = \frac{1}{2}$ bh)



6. Solve for x: $\frac{1}{2}(8 + 6x) = -10 + x$.

7. Find the slope of the line which passes through the points (–3, 7) and (3, –5).

8. What is wrong with this picture?



9. Solve the system algebraically. Check your answer by graphing.

   $3x + 2y = -2$

   $5x - 2y = 18$

10. Explain the difference between X + X and X • X.

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

WEEK 6

1. Solve: $6(x + 2) = 4x - 5$

2. Find the slope of the line that is represented with the equation $-2x + 2y = 4$.

3. Write the equation of the vertical line that passes through the point (2,-3).

4. A rectangle has a width 14 inches less than its length. If the area of the rectangle is 176 inches, what is the length and width of the rectangle?

5. Which of the following is equivalent to $\frac{6x^2y}{3xy^3}$?

   a) $\frac{x}{2y^2}$ b) $\frac{2x}{y^2}$

   c) $\frac{2x^3}{y^4}$ d) $\frac{x^3}{2y^4}$

6. You are riding your bike at an average speed of 25 miles per hour. The number of miles you ride, d, during t hours is given by $d = 25t$.

   a) Does the situation represent a direct variation?

   b) Draw a graph of the relation to support your answer.

7. Plot the points given. Is there a pattern? If yes, write an equation that represents the points.

   (0, 1) (–1, –2) (1, 4) (5, 16) (–8, –23)

8. Your parents have given you $90 to buy lunches at school. On average, you spend $2.50 per lunch per day. How long before you run out of money? That is, how many lunches are you able to buy? Write an equation and solve.

9. A classmate brings a box of 24 cookies for the class to share to share fairly with all students who want cookies. If all 12 students in the class want cookies, each student would get 2 cookies (12, 2). If only 8 people want cookies, each of these students could get 3 cookies (8, 3).

   a) Is this relation between the number of students who would like cookies (x) and the number of cookies each would get (y) a direct or inverse variation?

   b) Write an equation for the variation, using x and y as defined in part (a).

10. Solve and graph: $\frac{10}{3}x + 5y < 15$

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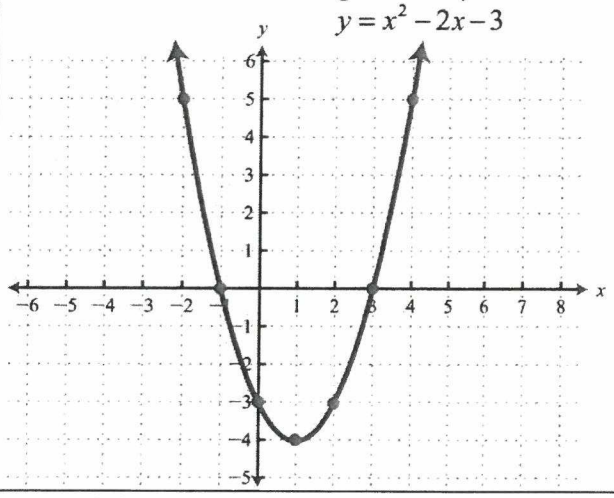
WEEK 7

1. How much non-overlapping wrapping paper would you need to wrap a cube? The sides of the cube are 3 inches each. (The formula for finding the surface area of a cube is $SA=6s^2$ where s represents the length of a side).

2. Find the domain and range of the quadratic function $y = x^2 - 2x - 3$

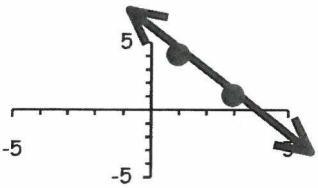


3. Which would be the best method of solving the linear system below? Explain your choice. Then solve the system.

   $3x - 2y = 11$

   $y = 4 + x$

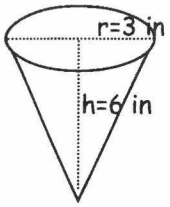
4. Find the slope of the line shown.



5. The length of a rectangle is $(x - 8)$ and the width is $(x + 5)$, Express the area of the rectangle as a polynomial in simplest form. ($A = lw$)

6. Write the equation of the line that passes through the points $(-7, -4)$ and $(-8, 3)$.

7. Find the volume of the cone. $V = \frac{1}{3}\pi r^2 h$



8. Simplify the expression.

$$\frac{5xy^0}{2y^3} \bullet \frac{12x^2y^7}{5x}$$

9. A recipe calls for $3\frac{1}{2}$ cups of flour to make 20 muffins. How much flour is needed to make 50 muffins?

10. Find the solution(s) of the equation $x^2 - 2x = 0$.

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

WEEK 8

1. Factor each polynomial.

   a) $x^2 - 9$

   b) $x^2 - 2x - 3$

   c) $2x^2 + 5x + 3$

2. The volume of a cube is 64 units^3. What is the length of one edge of the cube?

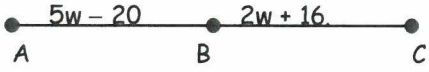
3. Jenny has a $100 clothing allowance to buy skirts and blouses. If blouses cost $25 and skirts are $30, write an equation that models how she can spend her money.

4. A formula for changing temperature from Fahrenheit to Celsius is $C = \frac{5}{9}(F - 32)$. Find the Celsius equivalent of 77°F.

5. Solve for a: $2ax + 3 = b$

6. A weather balloon in the shape of a sphere has a surface area of 160 square meters. If the formula for the surface area of a sphere is $S.A. = 4\pi r^2$, to the nearest tenth of a meter, what is the radius of the balloon?

7. Point B divides segment AC into two equal sections.

   a) Find the value of w.

   b) Find the measure of AB and BC.

8. A car uses 10 gallons of gasoline to travel 290 miles. How much gasoline will the car use to travel 400 miles?

9. Find the equation of a line that is parallel to the line $y = -4x - 2$ and passes through the point (5, 3).

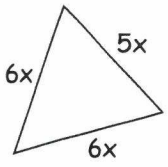
   (Hint: parallel lines have the same slope.)

10. Bob bought 3 apples and 2 tomatoes for $3.00 at the fruit stand. Maria bought 5 apples and 1 tomato at the same stand for $3.25. How much did each apple and each tomato cost?

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

WEEK 9

1. The perimeter of the triangle is 34 cm. Find the measure of each side.



2. Evaluate $-3x^3 + 5x$ when $x = -2$.

3. Rewrite the expressions in simplest radical form:

a) $\sqrt{144x^{10}y^2}$

b) $\sqrt{63x^5y^6}$

c) $\sqrt[3]{1000}$

d) $\sqrt[3]{250x^5y^6}$

4. The area of a circle is 36π inches^2. Find the radius of the circle. ($A = \pi r^2$)

5. Solve: $2x + 4y = 8$
$2x - 2y = -4$

6. Find the slope and the y-intercept of the line $2y - 4 = 8x$.

7. Translate the following verbal phrase into an algebraic inequality: "Three more than twice a number is less than four times the number."

8. Solve: $3x - 2(6x - 4) = 5x + 10$.

9. A rectangle has coordinates A(4, -3), B(-1, -3), C(-1, 2), and D(?, ?).

Find the missing coordinates, D, needed to complete the rectangle.

10. Using the rectangle ABCD in the previous problem, find the slopes of $\overline{AB}$, $\overline{CD}$, $\overline{AD}$, and $\overline{BC}$.

SUMMER REVIEW FOR STUDENTS **COMPLETING** ALGEBRA I

WEEK 10

1. What is the solution to

$$12 - \frac{1}{8}d = 17?$$

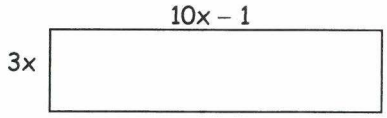
2. The volume of a can is 42.4 inches^3. Its diameter is 3 inches. Find the height. ($V = \pi r^2 h$)

3. Parallel lines (lines that never intersect) have the same slope. Find the equation of a line parallel to $y = \frac{1}{4}x + 7$ that passes through the point (0, 2).

4. Rewrite the following equation in slope-intercept form: $3x + 4y = 12$.

5. You are driving to Aunt Sally's house, which is 220 miles away. It takes 4 hours to get there. What is your average speed?

6. Write the simplest expression for the area and perimeter of the rectangle:



7. A page in a school yearbook is $8\frac{1}{2}$ in. by 11 in. The left margin is 1 in. and the right is $2\frac{1}{2}$ in. The space between two pictures is $\frac{1}{4}$ in. How wide should each picture be to fit three across the page?

8. Ski Tours offers a one-day package deal, which charges \$75 for the first person and \$55 for each additional person. A person tries to get a group of friends together who will split the entire cost evenly. Complete the table:

Persons	Group Cost	Individual Cost
1		
2		
3		
4		
5		

9. Sketch the graph of the line which contains the point (0, –3) and whose slope is 2/3.

10. Solve and graph on a number line:

$-2x + 1 < 7$.