



Summer Math Learning Packet

Students entering Algebra-12

The daily activities in this summer math packet will review math concepts and skills of the grade that has just been completed during the 2013-2014 school year. Just a few minutes each day spent “thinking and talking math” will help reinforce the math that has been learned and begin to bridge the foundation for extending to the concepts that will be developed next year. The goal is for you to have fun thinking and working collaboratively to communicate mathematical ideas. While you are working ask how the solution was found and why a particular strategy was chosen.

The math practice in this summer packet addresses the Fairfield Public School Curriculum for Mathematics which incorporates the Common Core Standards addressing these 3 critical areas in the Pre-Algebra-8 course:

- 1) Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
- 2) Grasping the concept of a function and using functions to describe quantitative relationships;
- 3) Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

The packet consists of 2 calendar pages, one for June/July and one for August, as well as directions for math games to be played at home. Literature, worksheets, APPs and websites are also recommended to explore mathematics in new ways. We encourage you to complete at least 15 math days each month. Keep track of your math in a journal.

Educational and Fun APPS and Websites to Practice Math

Student Accountability

I spent at least 10 minutes a day, 4 to 5 times a week, practicing math. I completed at least 250 – 300 minutes of math practice over the course of the summer. I recorded my minutes on the tracking sheet. I returned the recording sheet to my 9th grade math teacher. I also showed my teacher my journal where I kept track of my mathematical thinking.

Print Name

Student Signature

Date

Websites:	Great Math Books to Read:
<p>Here are websites that you can access at the Fairfield Public Library if you do not have a computer at home. You can record your activity on the “Create Your Own Summer Math Calendar!” sheet provided.</p> <p>http://www.ixl.com/ http://www.figurethis.org/index.html http://nrich.maths.org/frontpage http://www.khanacademy.org/ http://mathforum.org/index.html http://www.coolmath4kids.com/ http://www.figurethis.org/index.html http://www.thinkingblocks.com/ http://mathplayground.com/ http://illuminations.nctm.org/activitysearch.aspx</p>	<p><u>Evil Genius</u> by Catherine Jinks <u>Forever Changes</u> by Brendan Halpin <u>Geek Abroad</u> by Piper Banks <u>All of the Above</u> by Shelley Pearsall <u>Hannah Divided</u> by Adele Griffin <u>A Higher Geometry</u> by Sharelle Byars Moranville <u>Guinness Book of Records</u> by Time Inc <u>Mathematicians are People Too</u> by Luetta Reimer & Wilbert Reimer</p>

APPS to Practice Math!

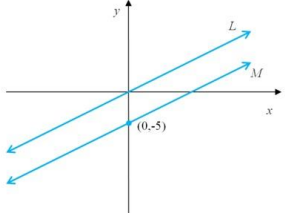
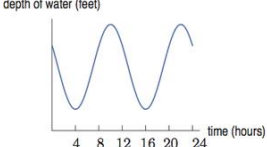
This is a great, fun way to get practice with math skills on a smartphone or iPad. Many of these Apps are free or inexpensive. There are lots of other apps out there, but these are some of our favorites.

APPS	APPS
<p>Nine Gaps Khan Academy Math Zombie Math Bingo Math Hunt Symmetry Shuffle Kakooma Deep sea duel Pick a path Lobster diver Math matrix Middle School Math HD</p>	<p>iCut Deluxe Math Doodles Flash to Pass Sumdog Sushi Monster, Slice It! Ratio rumble Chicken coop fractions Zoom math Super 7 Pizza shop and slide 1000</p>

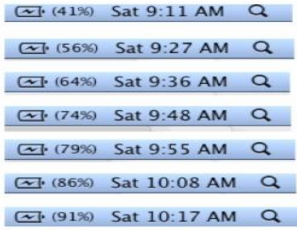
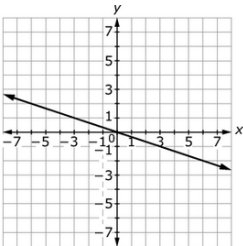
Worksheets to Practice Math

<http://www.commoncoresheets.com/>

Algebra-12 Summer Work Calendar June/July 2014

29	30 The cost to hire a plumber is \$45 per hour plus an initial fee of \$65. How long did the plumber work for a total charge of \$290?	1 A right triangle has sides of $\sqrt{10}$ and $\sqrt{6}$. What is the shortest and longest possible length of the third side?	2 Create an equation that has a variable on each side and has a solution of $x = -3$.	3 Go to website: http://nrich.maths.org/public/leg.php?code=71&cl=3&cldcmpid=5864 and use reasoning and proof to solve the problems.	4 Holiday	5																
6	7 Lines L and M have the same slope. The equation of line L is $4y = x$. Line M passes through the point $(0, -5)$. What is the equation of line M ? 	8 The point in the x - y plane with coordinates $(1000, 2014)$ is reflected across the line $y = 2000$. What are the coordinates of the reflected point?	9 The figure below gives the depth of the water at Montauk Point, New York, for a day in November.  How many high tides took place on this day? How many low tides took place on this day? How much time elapsed in between high tides?	10 Try a new activity at http://www.coolmath4kids.com/ Challenge yourself. What did you chose to do?	11 Solve the equations: a) $-3x + 12 = 5x - 10$ b) $4(x + 2) = 3x - 4$ c) $5x + 2(x + 6) = -9$	12																
13	14 Look up a math topic and read about the history. Who discovered it? How was it used? Ex. pi, gallons, metric...	15 Is the quadrilateral with vertices $(-6, 2)$, $(-3, 6)$, $(9, -3)$, $(6, -7)$ a rectangle? Explain.	16 Ask at least 15 people you know (friends, parents, siblings) to determine if they play a sport (yes/no) or do they play an instrument (yes/no). Create a graph that would help visualize the association, if any, between playing a sport and playing a musical instrument.	17 Visit the website http://nlvm.usu.edu/en/nav/vlibrary.html . Challenge yourself with fun activities! List them.	18 Determine two values of a such that it creates one solution and no solution respectively. $y = 3x - 5$ $y = ax + 3$	19																
20	21 A penny is about $\frac{1}{16}$ of an inch thick. Research the internet to determine how many pennies were minted in 2013 and determine how tall a stack would be in feet and inches.	22 Go to http://nrich.maths.org/public/leg.php?code=218&cl=3&cldcmpid=5864 website, and play a probability game.	23 Determine the missing values in the table if the input values can be any English word and output values are letters from the English alphabet. <table border="1" data-bbox="835 1156 1234 1214"> <tbody> <tr> <td>input</td> <td>cat</td> <td>house</td> <td>you</td> <td>stem</td> <td></td> <td></td> <td></td> </tr> <tr> <td>output</td> <td>t</td> <td>e</td> <td>u</td> <td></td> <td>z</td> <td></td> <td></td> </tr> </tbody> </table>	input	cat	house	you	stem				output	t	e	u		z			24 Choosing from the lengths below to make a triangle, which lengths would create a right triangle? 5cm, 6cm, 8 cm, 10 cm, 12 cm, 13 cm	25 Create two number sentences where the solution is -3 in which: a) Both numbers are integers b) Both numbers are fractions	26
input	cat	house	you	stem																		
output	t	e	u		z																	
27	28 If a six-pack of soda cost \$2.25, how much will it cost to buy 10 sodas?	29 Add & Subtract: $2\frac{1}{3} + (-3\frac{4}{5}) =$ $2\frac{1}{3} - (-3\frac{4}{5}) =$	30 Evaluate $f(-2)$ if $f(x) = 3x^2 - 5x + 2$	31 Choose a favorite professional athlete and research his/her annual salary. How much does s/he earn in a month? A day?																		

Algebra-12 Summer Work Calendar August 2014

					1 Choose a geometry activity at Math Illuminations http://illuminations.nctm.org/activitysearch.aspx X Record what you did.	2								
3	4 Using a receipt, find the mean, median, and mode of the prices of the items on the receipt from a store (grocery, clothing ...)	5 Solve: $3w + 50 = 20 + 5w$ Can you write a real world problem that this equation represents?	6 The pictures below show screenshots of the battery charge indicator after it was plugged into the computer at 9:11 a.m. What are the two variables in this situation? When will the battery be charged? 	7 Visit the website: http://nrich.maths.org/secondary-lower and play a game with positive and negative integers.	8 Play a strategy game. Ex. Monopoly, Parcheesi, Mancala, Connect Four ... What strategy did you use?	9								
10	11 Look up a famous math person and read about him/her. What did s/he discovered? How was it used? Ex. Fibonacci, Pythagoras ...	12 Play Sudoku from the newspaper How did logic help you to solve the puzzle?	13 Visit the website Figure This and look for a real life math challenge. http://www.figurethis.org/index.html	14 Determine a value of x such that $y = 17$ for $y = -3x + 2$	15 Write a system of equations that has a solution of $(-2, -4)$.	16								
17	18 visit the website: http://nrich.maths.org/5864 and play <i>Connect Three</i> with positive & negative integers.	19 Calculate: $\left(-1\frac{7}{8}\right)\left(2\frac{2}{5}\right) =$ $\left(-1\frac{7}{8}\right) \div \left(2\frac{2}{5}\right) =$	20 Tim claims that the difference between positive and negative number is always negative or zero. Write a situation that supports Tim's claim and another that disproves him.	21 A segment with endpoints of $(2,4)$ and $(-3,-1)$ is translated $\langle x - 3, y + 2 \rangle$. What are the new points of the segment?	22 A sphere and cone have the same volume. Each figure has a radius of 3 inches. What is the height of the cone?	23								
24	25 In the following equation, a and b are both integers, find their value: $a(3x - 8) = -18x + 2b$	26 John and Kim wrote down two different functions that have the same rate of change. John's function is represented by the table to the right. <table border="1" style="display: inline-table; vertical-align: middle;"><thead><tr><th>x</th><th>y</th></tr></thead><tbody><tr><td>-1</td><td>-5</td></tr><tr><td>1</td><td>-1</td></tr><tr><td>3</td><td>3</td></tr></tbody></table> Create a graph of Kim's function.	x	y	-1	-5	1	-1	3	3	27 Write an equation of the line in slope intercept from the graph on the right. 	28 YOU DID IT! Please bring your journal to your eighth grade teacher on the first day of school!	29	30
x	y													
-1	-5													
1	-1													
3	3													

Algebra-8 Answer Key

Answers will vary for many of the activities depending on the choices students make. Here are the answers for activities with specific solutions.

June 30

Let x = number of hours worked

$$45x + 65 = 290$$

$$45x = 225$$

$$x = 5 \text{ hours}$$

July 1

Longest possible length: 4

Shortest possible length: 2

July 2

Answers will vary (Possible answer: $3x - 4 = 9x - 22$)

July 7

$$y = \frac{1}{4}x - 5$$

July 8

(1000, 1986)

July 9

High Tides: 2

Low Tides: 2

Time between high tides: 12-hours

July 11

a) $x = -\frac{5}{2} = 2.5$

b) $x = -12$

c) $x = -3$

July 18

One solution: a = any number other than 3

No solution: $a = 3$

July 23

Answers will vary for most of the table. The output must equal the last letter of the input in the table.

July 24

6 cm, 8 cm, 10 cm

OR

5 cm, 12 cm, 13 cm

July 25

a) Answers will vary

Possible Answer: $5 + (-8) = -3$

b) Answers will vary

Possible Answer: $2\frac{3}{4} - 5\frac{3}{4}$

July 28

$$\frac{\text{Number of sodas}}{\text{Cost}} = \frac{6}{\$2.25} = \frac{10}{x}$$

$$x = \$3.75$$

July 29

$$2 + (-3) = -1$$

$$(-2) + (-3) = -5$$

$$(-2) + 3 = -1$$

July 30

$$f(-2) = 3(-2)^2 - 5(-2) + 2 = 24$$

August 5

$$w = 15$$

Possible problem: (Answers will vary)

Sally starts with \$50 and deposits \$3 per day. Harry starts with \$20 and adds \$5 per day. After how many days will they have the same amount of money?

August 6

The two variables are time, t and battery charge, b . There are several ways we can choose the units.

A reasonable choice is "time in minutes since the laptop was plugged in" and "battery charge in percentage of full, %". The approximate function of the variables can be defined as $b = 0.76t + 43$.

We can also use the equation to solve $0.76t + 43 = 100$ for t to obtain $t = 75$ minutes.

August 14

$$17 = -3x + 2$$

$$x = -5$$

August 15

Answers will vary. Possible equations:

$$2x - 3y = 8$$

$$5x + y = -14$$

August 19

a) $-\frac{9}{2} = 4\frac{1}{2}$

b) $-\frac{25}{32}$

August 20

Answers will vary

Supports Tim's claim:

$$-2 - (+3) = -5$$

Disproves Tim's claim

$$+3 - (-2) = +5$$

August 21

New endpoints are (5, 2) and (-6, 3)

August 22

The height of the cone is 12 inches.

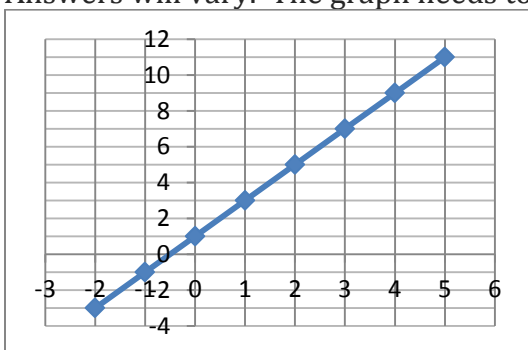
August 25

$$a = -6$$

$$b = 24$$

August 26

Answers will vary. The graph needs to have a slope of 2. Sample graph below.

**August 27**

$$y = -\frac{1}{3}x$$