



# Summer Math Learning Packet

## *Students entering Pre-Algebra-7*

The daily activities in this summer math packet will review math concepts and skills of the grade that has just been completed during the prior 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 6 critical areas from the Transition to Pre-Algebra course:**

- 1) Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers,
- 2) Connecting ratio and rate to whole number multiplication and division, and using concepts of ratio and rate to solve problems,
- 3) Writing, interpreting, and using expressions and equations,
- 4) Reasoning about relationships among shapes to determine area, surface area, and volume,
- 5) Developing understanding of statistical thinking.
- 6) Recognizing fractions, decimals, and percent as different representations of rational numbers along with extending addition, subtraction, multiplication, and division to all rational numbers.

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 7<sup>th</sup> grade math teacher. I also showed my teacher my journal where I kept track of my mathematical thinking.

\_\_\_\_\_

Print Name

\_\_\_\_\_

Student Signature

\_\_\_\_\_

Date

<p><b>Websites:</b></p> <p>Here are websites that you can access at the <b>Fairfield Public Library</b> 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><a href="http://www.ixl.com/">http://www.ixl.com/</a>  <a href="http://www.figurethis.org/index.html">http://www.figurethis.org/index.html</a>  <a href="http://nrich.maths.org/frontpage">http://nrich.maths.org/frontpage</a>  <a href="http://www.khanacademy.org/">http://www.khanacademy.org/</a>  <a href="http://mathforum.org/index.html">http://mathforum.org/index.html</a>  <a href="http://www.coolmath4kids.com/">http://www.coolmath4kids.com/</a>  <a href="http://www.figurethis.org/index.html">http://www.figurethis.org/index.html</a>  <a href="http://www.thinkingblocks.com/">http://www.thinkingblocks.com/</a>  <a href="http://mathplayground.com/">http://mathplayground.com/</a>  <a href="http://illuminations.nctm.org/activitysearch.aspx">http://illuminations.nctm.org/activitysearch.aspx</a></p>	<p><b>Great Math Books to Read:</b></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 &amp; 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.

<p><b>APPS</b></p> <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><b>APPS</b></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/>

## Pre-Algebra-7 Summer Work Calendar

### June/July

End of June/ First Week of July	Day 1 At Books Unlimited, 3 paperback books cost \$18. What would 7 books cost? How many books could be purchased with \$54?	Day 2 In trail mix, the ratio of cups of peanuts to cups of chocolate candies is 3 to 2. How many cups of chocolate candies would be needed for 9 cups of peanuts?	Day 3 A tank is 24 cm wide, and 30 cm long. It contains a stone and is filled with water to a height of 8 cm. When the stone is pulled out of the tank, the height of the water drops to 6 cm. Find the volume of the stone.	Day 4 If it took 7 hours to mow 4 lawns, then, at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	Day 5 Place the numbers -2, -1, 0, 1, 2 in the circles in the diagram so the sum of the numbers in each direction is the same.  <div style="text-align: center;"> </div>
Week 2	Day 6 What is the prime factorization of 32?	Day 7 Some kids like to ride their bikes to and from school. Let $d$ be the distance in miles from a kid's home to school. Write 2 expressions to represent how far a kid travels by bike in 4 weeks.	Day 8 Try a new activity at <a href="http://www.coolmath4kids.com/">http://www.coolmath4kids.com/</a> . Challenge yourself. What did you chose to do?	Day 9 List all the factors of 48. List all the factors of 64. What are the common factors of 48 and 64? What is the greatest common factor of 48 and 64?	Day 10 Write an expression to represent the situation. The skating rink charges \$100 to reserve and then \$5 per person. Write an expression to represent the cost for any number of people.
Week 3	Day 11 The temperature is $-28^{\circ}\text{F}$ in Anchorage, Alaska and $65^{\circ}\text{F}$ in Miami, Florida. How many degrees warmer is it in Miami than in Anchorage?	Day 12 Seth wants to buy a new skateboard that costs \$169. He has \$88. If he earns \$7.25 an hour pulling weeds, how many hours will he have to work to earn the rest of the money needed?	Day 13 Lin rode a bike 20 miles in 150 minutes. If she rode at a constant speed, how far did she ride in 15 minutes? How long did it take her to ride 6 miles? How fast did she ride in miles per hour?	Day 14 If the mean, median, and mode are all equal for the following set, what is the value of $x$ ? $\{3, 4, 5, 8, x\}$	Day 15 Alisa had $\frac{1}{2}$ liter of juice in a bottle. She drank $\frac{3}{8}$ liters of juice. What fraction of the juice in the bottle did Alisa drink?
Week 4	Day 16 Look up a math topic and read about the history. Who discovered it? How was it used? Ex. pi, gallons, metric...	Day 17 Try "Beatcalc" at <a href="http://mathforum.org/index.html">http://mathforum.org/index.html</a>	Day 18 What is the smallest number that is divisible by 1,2,3,4,5,6,7,8,9 and 10? How do you know?	Day 19 Mia walks her dog twice a day. Her evening walk is two and a half times as far as her morning walk. At the end of the week she says she walked her dog 30 miles. How long is her morning walk?	Day 20 Find two numbers that have 2,3, and 5 as factors.
Week 5	Day 21 The temperature in Alaska was 23 degrees below zero and in Maine was 14 degrees below zero. Ben wrote <i>Maine was colder because <math>-14 &lt; -23</math></i> . Is Ben correct? Explain your answer.	Day 22 Try one of the recommended websites. Record what you did.	Day 23 Will this net form a triangular prism?  <div style="text-align: center;"> </div>	Day 24 The Patriots beat the Giants in a football game. The sum of their scores was 44. The difference of their scores was 20. How many points did the Patriots score?	Day 25 Choose a geometry activity at <b>Math Illuminations</b>  <a href="http://illuminations.nctm.org/Games-Puzzles.aspx">http://illuminations.nctm.org/Games-Puzzles.aspx</a>

## Pre-Algebra-7 Summer Work Calendar

### August

Week 6	Day 26 Visit the website <a href="http://nlvm.usu.edu/en/nav/vlibrary.html">http://nlvm.usu.edu/en/nav/vlibrary.html</a> Challenge yourself with fun activities! List them.	Day 27 Add: $2 + (-3) =$  $(-2) + (-3) =$  $(-2) + 3 =$	Day 28 The average of six numbers is 4. A seventh is added and the new average is 5. Find the seventh number.	Day 29 Sophia's dad paid \$43.25 for 12.5 gallons of gas. What is the cost of one gallon of gas?	Day 30 Bryan sells candy bars at 4 for 50¢. How many candy bars must Bryan sell in order to make \$5.00?
Week 7	Day 31 Are $3(3x - y)$ and $12(x - 4y)$ equivalent expressions?	Day 32 If the product of 6 integers is negative, at most how many of the integers can be negative?	Day 33 The lowest temperature ever recorded on earth was $-89^{\circ}\text{C}$ in Antarctica. The average temperature on Mars is about $-55^{\circ}\text{C}$ . Which is warmer? Write an inequality to support your answer.	Day 34 What is the largest possible area (in square inches) for a rectangle with a perimeter of 120 inches?	Day 35 If Terri swam 3 laps in 2.5 minutes, how long would it take her to swim 20 laps at the same rate?
Week 8	Day 36 What is a real life example of:  $3/4 \div 1/2 =$	Day 37 What is the smallest three digit number that is divisible by exactly three different prime numbers?	Day 38 Given an expression such as $3x + 2y$ , find the value of the expression when $x$ is equal to 4 and $y$ is equal to 2.4.	Day 39 A B C D $\underline{\quad} \times 4$ D C B A What is the value of A, B, C, and D if they are each a different digit?	Day 40 Solve: $45 \div (-9) =$  $(-105) \div (-15) =$
Week 9	Day 41 Denver's elevation is 5280 feet above sea level. Death Valley's is $-282$ feet. Is Death Valley located above or below sea level? Explain. How many feet higher is Denver than Death Valley?	Day 42 Amy has a fish tank that is a rectangular prism, 20 cm by 20 cm by 16 cm. What is the volume of the tank? If Amy only fills the tank $3/4$ of the way, what will be the volume of the water in the tank?	Day 43 Alex is painting 4 exterior walls of a rectangular barn. The length is 80 feet, width is 50 feet, and height is 30 feet. The paint costs \$28 per gallon, and each gallon covers 420 sq. feet. How much will it cost? Explain.	Day 44 Say the remainder of $x$ when divided by 6 is 2. Which of these numbers below cannot be a value for $x$ ? 8, 194, 52, 116, 61	Day 45 <b>YOU DID IT!</b> Please bring your journal to your seventh grade teacher on the first day of school!





## Math 7 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.

### Day 1

To find the price of 1 book, divide \$18 by 3. One book is \$6. To find the price of 7 books, multiply \$6 (the cost of one book times 7 to get \$42. To find the number of books that can be purchased with \$54, multiply \$6 times 9 to get \$54 and then multiply 1 book times 9 to get 9 books.

Number of Books	Cost
1	6
3	18
7	42
9	54

### Day 2

One possible way to solve this problem is to recognize that 3 cups of peanuts times 3 will give 9 cups. The amount of chocolate will also increase at the same rate (3 times) to give 6 cups of chocolate.

Students could also find the number of cups of chocolate candies for 1 cup of peanuts by dividing both sides of the table by 3, giving  $\frac{2}{3}$  cup of chocolate for each cup of peanuts. To find the amount of chocolate needed for 9 cups of peanuts, students multiply the unit rate by nine ( $9 \times \frac{2}{3}$ ), giving 6 cups of chocolate.

### Day 3

This problem is based on Archimedes' Principle that the volume of an immersed object is equivalent to the volume of the displaced water. While the stone itself is an irregular solid, relating it to the displaced water in a rectangular tank means that the actual volume calculation is that of a rectangular prism, and therefore, fits in with content standard 6.G.2.

Solution: Using the formula  $V = lwh$

The change in water height is  $8 \text{ cm} - 6 \text{ cm} = 2 \text{ cm}$ . The volume of the displaced water is the product of the length, width, and change in the height of the water, and  $24 \times 30 \times 2 = 1440$ . The volume of the stone is the same as the volume of the displaced water, we know the stone has volume 1440 cm.

### Day 4

Twenty lawns can be mowed in 35 hours. The lawns per hour are about 0.57 or just over a half of a lawn per hour.

### Day 5

Possible answer:

-2   0   2  
1  
-1

**Day 6**

The prime factorization of 32 is  $2^5$

**Day 7**

The given solution shows some possible equivalent expressions, but there are many variations possible.

- The distance to school, and therefore home, is  $d$ . Thus, the student rides  $(d + d)$  miles in one day. Equivalently, she rides  $(2d)$  miles in one day.
- Repeatedly adding the distance traveled in one day for each school day of the week, we find that in one week the student travels  $(2d + 2d + 2d + 2d + 2d)$  miles.
- Equivalently, she travels  $5(2d)$  or  $(10d)$  miles in a week.

**Day 9**

Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48

Factors of 64: 1, 2, 4, 8, 16, 32, 64

Common factors: 1, 2, 4, 8, 16

Greatest Common Factor (GCF): 16

**Day 10**

$n$  = the number of people

$$100 + 5n$$

**Day 11**

We can count from -28 up to 65. If Anchorage, Alaska was 28 degrees warmer than it is on this winter morning, the temperature would be zero degrees. If Anchorage, Alaska was 65 degrees warmer still, the temperature would be 65 degrees, the same temperature as Miami, Florida. In order for Anchorage, Alaska to be the same temperature as Miami, Florida, Anchorage would have to be  $28+65=93$  degrees warmer than it is. Thus, Miami is 93 degrees warmer than Anchorage.

**Day 12**

$167 - 88 = 79$ , so Seth needs to make \$79. Since  $79 \div 7.25 \approx 10.9$ , Seth will have to work about 11 hours to make enough money to buy the skateboard.

**Day 13**

- She could ride 1 mile in 7.5 minutes and 2 miles  $(1 + 1)$  in 15 minutes  $(7.5 + 7.5)$ .
- She rides 150/20 minutes per mile which is 7.5 minutes per mile. So it would take her 45 minutes to ride 6 miles because  $6 \times 7.5 = 45$ .
- If she rides 2 miles in 15 minutes, then she can ride 4 miles in 30 minutes and 8 miles per hour.

**Day 14**

$$x = 5$$



**Day 15**

This question is equivalent to asking, "What fraction of  $\frac{1}{2}$  liter is  $\frac{3}{8}$  liter?" We can write this symbolically as  $(?) \times (\frac{1}{2}) = \frac{3}{8}$  which is equivalent to the division problem  $\frac{3}{8} \div \frac{1}{2} = ?$

So:  $\frac{3}{8} \div \frac{1}{2} = \frac{3}{8} \times \frac{2}{1} = \frac{6}{8} = \frac{3}{4}$

Alisa drank  $\frac{3}{4}$  of the juice that was in the bottle.

**Day 18**

2,520

**Day 19**

- If we let  $w$  denote the length of the morning walk, Mia walks  $w + 2.5w$  or  $3.5w$  miles each day.
- At the end of the week she has walked 7 times as far and she said that this was 30 miles.
- Solving the equation  $24.5w = 30$ , we have  $w = 30/24.5 \approx 1.2$  miles.
- Therefore the distance of Mia's morning walk is about 1.2 miles.

**Day 20**

Examples:

30 and 60

**Day 21**

Ben is incorrect. It is common for students to compare negative numbers as if they were positive and to assume that the one with the greatest magnitude is the greatest number. However,  $-23$  is to the left of  $-14$  on the number line, and so it is less than  $-14$ . Thus  $-23 < -14$  and Alaska was colder.

**Day 23**

Yes, it will form a triangular prism.

**Day 24**

The Patriots scored 32 points and the Giants 12.

**Day 28**

The seventh number would be 11.

**Day 29**

Sophia's dad paid \$43.25 for 12.5 gallons of gas. If we think of a gallon of gas a group, we know that the cost of 12.5 groups is \$43.25. The question we are asked is, "What is the cost of one gallon?" which is the same as asking, "How many dollars in one group?" To find the answer to this question, we must evenly distribute the \$43.25 amongst the 12.5 groups. This meaning of  $\$43.25 \div 12.5$ . So the cost of one gallon of gas is  $\$43.25 \div 12.5 = \$3.46$

**Day 30**

Bryan must sell 40 candy bars.

**Day 31**

They are not equivalent expressions.

**Day 33**

$$-55 > -89$$

The average temperature on Mars is warmer than the coldest temperature on Earth.

**Day 34**

The largest possible area would be a square with a side length of 30. The area would be 900 square inches.

**Day 35**

It would take Terri  $16 \frac{2}{3}$  minutes to swim 20 laps.

**Day 37**

The smallest three-digit number that is divisible by exactly three different prime numbers is 102. It is divisible by 2, 3 and 17.

**Day 38**

This problem requires students to understand that multiplication is understood when numbers and variables are written together and to use the order of operations to evaluate.

$$(3 \times 4) + (2 \times 2.4) =$$
$$12 + 4.8 = 16.8$$

**Day 39**

$$A = 2$$

$$B = 1$$

$$C = 7$$

$$D = 8$$

**Day 40**

The sum of the first ten prime numbers is 129.

**Day 41**

Death Valley is located below sea level. We know this because its elevation is negative. Sea level is the base for measuring elevation. Sea level elevation is defined as 0 ft. All other elevations are measured from sea level. Those places on Earth that are above sea level have positive elevations, and those places on Earth that are below sea level have negative elevations. Thus, Death Valley, with an elevation of -282 feet, is located below sea level.

To find out how much higher Denver is than Death Valley, we can reason as follows:

Death Valley is 282 feet below sea level. Denver is 5280 above sea level. So to go from Death Valley to Denver, you would go up 282 feet to get to sea level and then go up another 5280 feet to get to Denver for a total of  $282 + 5280 = 5562$  feet. Thus, Denver, Colorado is 5562 feet higher than Death Valley, California.

**Day 42**

$$V = lwh = 20 \times 20 \times 16 = 6400 \text{ cm}^3$$

If Amy fills the tank  $\frac{3}{4}$  of the way, the height of the water in the tank will be  $\frac{3}{4} \times 16 = 12$  cm, while the width and the length remain unchanged. So the volume of the water will be:  $V = lwh = 20 \times 20 \times 12 = 4800 \text{ cm}^3$ .

**Day 43**

Find the area to paint, then the number of gallons to cover the area.

First Alexis needs to find the area she needs to paint. Alexis will need to paint two 30 foot - by - 50 foot walls and two 30 foot - by - 80 foot walls:

$$2 \times 30 \text{ feet} \times 50 \text{ feet} = 3000 \text{ square feet}$$

$$2 \times 30 \text{ feet} \times 80 \text{ feet} = 4800 \text{ square feet}$$

Alexis will need to paint  $3000 + 4800 = 7800$  square feet.

Next, the table below shows how many square feet she can cover with different quantities of paint. 20 gallons is a little more than she needs, so she can check 19 gallons and 18 gallons:

**Day 44**

52 and 61