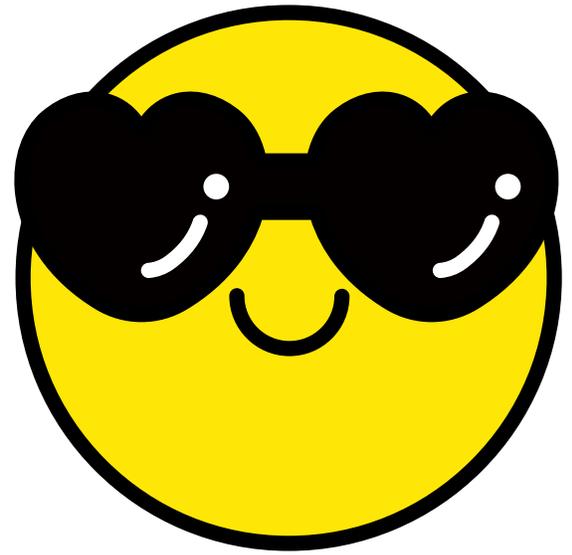


RISING 7<sup>TH</sup> GRADE EDITION



# DAM GOOD MATH

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A super fun summer math workbook  
for **Beaver Middle School** students



**This book belongs to ...**

# Hi, students!

It's no secret we  math, so we created this fun workbook for you to work on throughout the summer. While this work is optional, we hope you explore the following pages. You'll notice all of the topics are review; we did this on purpose!

As you know, math at Beaver is all about *investigating* and *discovering* new ideas together. The best way to ensure you are ready to collaborate and explore new math next year is by spending a little time this summer to keep these topics in your toolkit.

You can sit and do the workbook all at once—or you can do a problem here and a problem there.

However, wherever, whenever! It's as easy as  $\pi$ .

Now, go have a DAM good summer! 

**- The MS Math Team**



# RISING 7<sup>TH</sup> GRADE SUMMER MATH PRACTICE

- However, wherever, whenever! The guide below will help you start and ensure everything gets done before school starts.
- Leave out the calculator. You won't need it!

Suggested Date	Topic
<b>Week 1</b> June 16 - 20	Order of Operations Converting Between Fractions and Decimals
<b>Week 2</b> June 23 - 27	Rates and Ratios
<b>Week 3</b> June 30 - July 4	Percentages Comparing and Ordering Fractions and Decimals
<b>Week 4</b> July 7 - 11	Decimal Operations
<b>Week 5</b> July 14 - 18	Fraction Operations
<b>Week 6</b> July 21 - 25	Comparing Integers and Coordinate Plane
<b>Week 7</b> July 28 - August 1	Operations with Integers
<b>Week 8</b> August 4 - 8	Algebraic Expressions
<b>Week 9</b> August 11 - 15	Algebraic Equations
<b>Week 10</b> August 18 - 22	Take this time to complete any work in this packet that is not complete. Complete the Student and Parent Reflections.
<b>FIRST DAY OF SCHOOL</b> September 2nd	Give your Summer Math Practice to Ms. Bell, receive a 🎁 !



# Week 1: Order of Operations/Converting Between Fractions and Decimals

## Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)

ex:  $5 + 4(3 - 1.2)$

2. Exponents

$5 + 4(1.8)$

3. Multiplication & Division (left to right)

$5 + 7.2$

4. Addition & Subtraction (left to right)

$12.2$

**Make sure you work down and not across!**

$$10 + 5 \cdot 5 - 4$$

$$20 - (3 + 4) \cdot 2$$

$$\frac{9 + 3(2)}{4 - 1}$$

$$16 \div 2^3 + 5(3)$$



Examples: Write  $\frac{21}{25}$  as a decimal

**Method 1:**

Change  $\frac{21}{25}$  to a fraction with a denominator of 10, 100, or 1000

EX:  $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$$\frac{21}{25} = \frac{\cancel{x4} 84}{\cancel{x4} 100} = \frac{84}{100} = 0.84 \text{ as a decimal}$$

**Method 2:** Divide 21 by 25

$$\begin{array}{r} 0.84 \\ 25 \overline{)21.00} \\ \underline{-200} \phantom{00} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

Therefore:  $\frac{21}{25} = 0.84$

Write  $\frac{19}{20}$  as a decimal. Use Method 1.

Write  $\frac{7}{8}$  as a decimal. Use Method 2.

Write  $\frac{3}{16}$  as a decimal. Use Method 2.

Write  $\frac{27}{40}$  as a decimal. Use Method 2.

Write  $\frac{8}{25}$  as a decimal. Use Method 1.

Write  $\frac{4}{5}$  as a decimal. Use Method 1.



# Week 2: Rates and Ratios

## Ratios

Ratios are comparisons of two quantities.  
There are 3 different ways to write ratios:

- Fraction  $\left(\frac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

Ratios can be simplified just like fractions.

ex: write the ratio of triangles to circles  
in 3 ways:  $\triangle \triangle \triangle \triangle \circ \circ$

$\frac{4}{2} = \frac{2}{1}, 2:1, 2 \text{ to } 1$

## Rates & Unit Rates

Rates are ratios that compare quantities measured in different units.  
A unit rate is a rate with a denominator of 1.

ex: express as a unit rate:  
125 miles in 4 hours

To convert a rate to a unit rate:

1. Divide the numerator by the denominator
2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

$\frac{125 \text{ mi}}{4 \text{ hr}} \quad 125 \div 4 = 31.25$

$\frac{31.25 \text{ mi}}{1 \text{ hr}}$  or 31.25 miles per hr

<p>A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies in three different ways.</p>	<p>A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas. Write your answer in any of the three forms.</p>
<p>A jar contains 4 blue marbles and 9 red marbles. What is the ratio of blue marbles to total marbles? Write your answer in any of the three forms.</p>	<p>Write as a unit rate: <b>124 feet in 10 seconds</b></p>
<p>Write as a unit rate: <b>297 miles on 11 gallons of gas</b></p>	<p>Write as a unit rate: <b>\$27.30 in 3 hours</b></p>



Loren and Julie have different part-time jobs after school. They are both paid at a constant rate of dollars per hour. The tables below show Loren and Julie's total income (amount earned) for working a given time.

Loren

<b>Hours</b>	2	4	6	8	10	12	14	16	18
<b>Dollars</b>	18	36	54	72	90	108			162

Julie

<b>Hours</b>	3	6	9	12	15	18	21	24	27
<b>Dollars</b>	36		108	144	180	216		288	324

1. Find the missing values in the tables above.
2. Who makes more per hour? Justify your answer.
3. Write how much Julie makes as a rate. What is the unit rate?
4. How much money would Julie earn for working 16 hours? Show your work!
5. What is the ratio between how much Loren makes per hour and how much Julie makes per hour?



# Week 3: Percentages/Comparing Fractions and Decimals

**Fractions, Decimals, & Percent**

To convert a:

- Decimal to Percent: move the decimal point 2 places to the right      ex:  $0.345 = 34.5\%$
- Percent to Decimal: move the decimal point 2 places to the left      ex:  $7\% = 0.07$
- Decimal to Fraction: write the decimal over the place value of the last digit and then simplify      ex:  $0.008 = \frac{8}{1000} = \frac{1}{125}$
- Fraction to Decimal: divide the numerator by the denominator      ex:  $\frac{1}{5} = 5 \overline{)1.0}$
- Percent to Fraction: write the percent over 100 and then simplify      ex:  $45\% = \frac{45}{100} = \frac{9}{20}$
- Fraction to Percent: convert the fraction to a decimal and then convert the decimal to a percent      ex:  $\frac{3}{10} = 0.3 = 30\%$

Complete the table to convert each number to a percent, fraction, and/or decimal.

Fraction	Decimal	Percent
$\frac{3}{8}$		
	0.45	
		72%
	0.1	
$\frac{3}{200}$		



## Percent of a Number

1. Find 1% of the number
2. Use multiplication

Find 18% of 40.

Number	%
40	100%
$\div 100 \rightarrow 0.4$	1% $\rightarrow \div 100$
$\times 18 \rightarrow 7.2$	18% $\rightarrow \times 18$

18% of 40 = 7.2

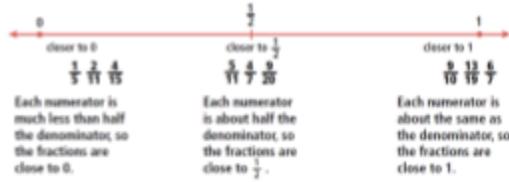
Find each percent of a number. Show your work.

30% of 90	15% of 38
75% of 160	50% of 86
24% of 35	2% of 74



## Comparing Fractions

1. Is the fraction close to zero, close to  $\frac{1}{2}$ , close to 1 (more or less)?



2. You can always find a common denominator!

$$\frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20}$$

$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \frac{15}{20}$$

$$\frac{2}{5} < \frac{3}{4}$$

Compare the following fractions using  $>$ ,  $<$  or  $=$ . Give a reason to support your answer.

$\frac{4}{5}$ ----- $\frac{1}{3}$	$1\frac{2}{3}$ ----- $\frac{7}{8}$	$\frac{4}{9}$ ----- $\frac{3}{8}$
REASON:	REASON:	REASON:
$\frac{5}{12}$ ----- $\frac{9}{10}$	$\frac{10}{11}$ ----- 0.75	5% ----- $\frac{2}{5}$
REASON:	REASON:	REASON:

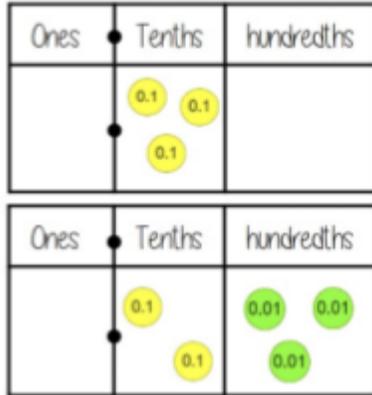
Put the following fractions in order from least to greatest:

$$\frac{6}{11}, 2\frac{4}{5}, \frac{1}{3}, \frac{7}{8}, \frac{9}{7}$$



Comparing decimals

Which the largest of **0.3** and **0.23**?



**0.3 > 0.23**

"There are more counters in the furthest column to the left"

0.30  
0.23

Comparing the values both with the same number of decimal places is another way to compare the number of tenths and hundredths

Compare the following decimals using >, < or = . Give a reason to support your answer.

0.5 _____ 0.45  REASON:	1.2 _____ 1.02  REASON:	0.65 _____ 0.66  REASON:
1.04 _____ 1.4  REASON:	0.75 _____ 0.8  REASON:	30% _____ 0.1  REASON:

Put the following decimals in order from least to greatest:

1.3, 0.98, 1.03, 0.76, 1.2



# Week 4: Decimal Operations

## Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.
2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.
3. Add/subtract as if the numbers are whole numbers.
4. Bring the decimal point straight down

ex:  $14.2 - 7.934$

$$\begin{array}{r} 14.200 \\ - 7.934 \\ \hline 6.266 \end{array}$$

Add or subtract the following decimals. Show your work.

$5.983 + 2.99$	$3.9 + 0.07$	$98 + 7.92$
$224 - 56.73$	$1.2 - 0.76$	$6.12 - 4.923$



## Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimals **do not need** to be lined up.
2. Ignore the decimals and multiply as if the numbers are whole numbers.
3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has the same number of decimal places.

ex:  $6.94 \times 7.8$

$$\begin{array}{r}
 6.94 \rightarrow 2 \text{ decimal places} \\
 \times 7.8 \rightarrow 1 \text{ decimal place} \\
 \hline
 + 5552 \\
 48580 \\
 \hline
 54132
 \end{array}$$

3 decimal places

54.132

Multiply the following decimals. Show your work.

$24.5 \times 0.3$	$0.23 \times 7$	$1.02 \times 0.4$
$0.75 \times 0.2$	$32.6 \times 0.8$	$4.56 \times 0.02$



## Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.
2. Multiply the divisor and dividend by the same power of ten so that the dividend becomes a whole number. Bring the decimal up from the divisor.
3. Divide as if the numbers are both whole numbers.
4. Add zeros in the dividend as needed until there is no remainder.

ex:  $25.3 \div 0.3$

$$\begin{array}{r} \boxed{84.3} \\ 0.3 \overline{) 25.30} \\ \underline{-24} \phantom{0} \\ 13 \phantom{0} \\ \underline{-12} \phantom{0} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

Divide the following decimals. Show your work.

$$86.1 \div 1.5$$

$$1.47 \div 0.3$$

$$6.208 \div 1.6$$



# Week 5: Fraction Operations

## Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.
2. Add the two numerators and keep the denominators the same.
3. Add the whole numbers.
4. Simplify the answer.

ex:  $3\frac{3}{4} + 2\frac{1}{2}$

$$\begin{array}{r} 3\frac{3}{4} = 3\frac{3}{4} \\ + 2\frac{1}{2} = 2\frac{2}{4} \\ \hline 5\frac{5}{4} = 6\frac{1}{4} \end{array}$$

Add or subtract the following fractions. Show your work.

$\frac{4}{5} + \frac{3}{4}$	$4\frac{2}{7} + 2\frac{9}{14}$	$2\frac{1}{8} + 3\frac{5}{12}$
$\frac{8}{9} - \frac{1}{6}$	$6 - \frac{3}{8}$	$4\frac{5}{6} - 1\frac{2}{15}$



## Multiplying and Dividing Fractions

1. Turn any mixed numbers into improper fractions.

$$\text{ex: } 2\frac{1}{6} \cdot \frac{4}{7}$$

$$\text{ex: } 7 \div 1\frac{3}{4}$$

2. Cross-simplify when possible.

$$\frac{13}{3\cancel{7}} \cdot \frac{\cancel{4}^2}{7} = \frac{26}{21} = 1\frac{5}{21}$$

$$\frac{7}{1} + \frac{7}{4}$$

$$\frac{1\cancel{7}}{1} \cdot \frac{4}{\cancel{4}_1} = \frac{4}{1} = 4$$

3. When dividing, remember to switch the second fraction to its reciprocal.

4. Multiply the numerators and multiply the denominators.

Multiply or divide the following fractions. Show your work.

$$\frac{3}{8} \times \frac{2}{7}$$

$$1\frac{2}{3} \times \frac{9}{10}$$

$$6\frac{5}{8} \times 3\frac{1}{2}$$

$$\frac{7}{9} \div \frac{2}{3}$$

$$\frac{4}{5} \div 10$$

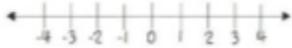
$$5\frac{2}{3} \div 2\frac{5}{6}$$



# Week 6: Comparing Integers and Coordinate Plane

## Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number is on the number line, the greater it is.



The absolute value of a number is the distance the number is from zero.

ex: compare with  $<$ ,  $>$ , or  $=$

$$-7 \bigcirc |-9| \leftarrow \text{The absolute value of } -9 = 9$$

$$-7 \boxed{<} 9$$

Compare the following integers with  $>$ ,  $<$  or  $=$

$-4 \underline{\hspace{1cm}} -5$	$2 \underline{\hspace{1cm}} -2$	$-7 \underline{\hspace{1cm}} 0$	$-13 \underline{\hspace{1cm}} -9$	$-25 \underline{\hspace{1cm}} -100$
$ 2  \underline{\hspace{1cm}}  -2 $	$ -4  \underline{\hspace{1cm}}  -6 $	$ -7  \underline{\hspace{1cm}} -6$	$ -3  \underline{\hspace{1cm}}  -2 $	$0 \underline{\hspace{1cm}}  -10 $

Mark the given numbers on the number line and then arrange them in order.

$$A = 3, B = -2, C = -1, D = -3$$



$$\boxed{\phantom{0}} < \boxed{\phantom{0}} < \boxed{\phantom{0}} < \boxed{\phantom{0}}$$

Write the smallest and the largest integers in the given set.

(a)  $-16, 61, 96, -79, 56$

Smallest:  $\boxed{\phantom{0}}$

Largest:  $\boxed{\phantom{0}}$

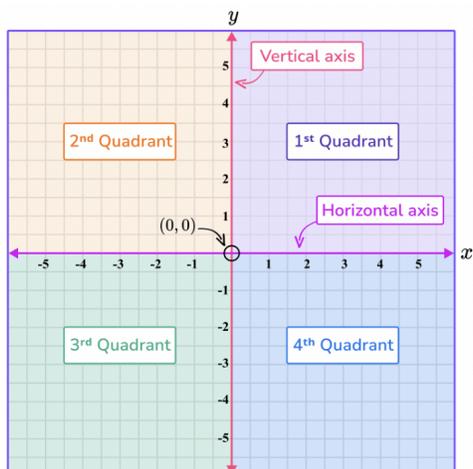
(b)  $-232, 322, 233, -322, -323$

Smallest:  $\boxed{\phantom{0}}$

Largest:  $\boxed{\phantom{0}}$

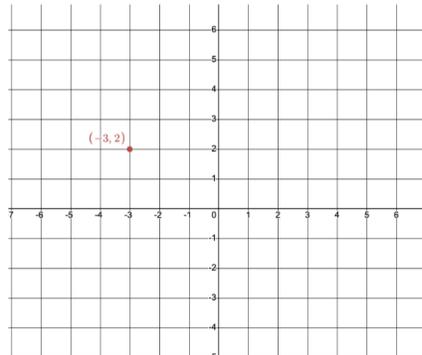


# Reminders: Coordinate Plane



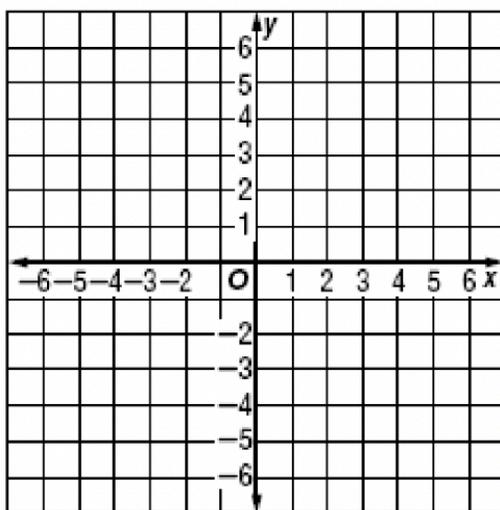
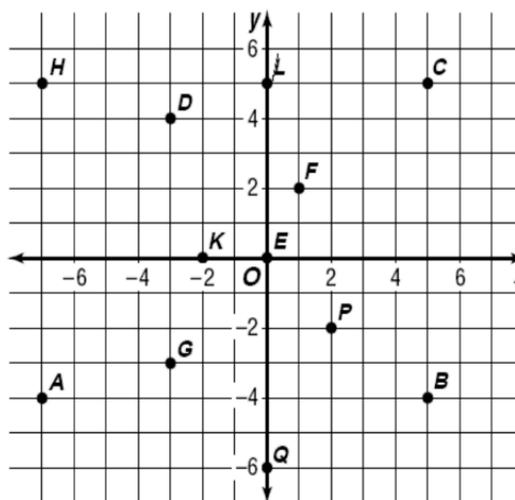
## Graphing a Point:

Example  $(-3, 2)$ . Start at the origin  $(0, 0)$ . Move left 3 units and up 2 units.



Write the ordered pair for each point *and* name the quadrant it's located in.

1. H \_\_\_\_\_
2. F \_\_\_\_\_
3. G \_\_\_\_\_
4. E \_\_\_\_\_
5. A \_\_\_\_\_
6. B \_\_\_\_\_
7. Q \_\_\_\_\_
8. C \_\_\_\_\_



Label the four quadrants.

Label the origin.

Graph and label the following:

W  $(-3, 0)$

I  $(-2, -3)$

N  $(0, 4)$

T  $(-1, 2)$

E  $(6, -2)$

R  $(-5, -6)$



# Week 7: Operations with Integers

**Integer Addition**

*Think about piles and holes!*

$5 + -2 = 3$

**Integer Subtraction**

SUBTRACTION EQUALS ADDING THE OPPOSITE

$\oplus - \oplus$  changes to  $\oplus + \ominus$   
 $\oplus - \ominus$  changes to  $\oplus + \oplus$   
 $\ominus - \oplus$  changes to  $\ominus + \ominus$   
 $\ominus - \ominus$  changes to  $\ominus + \oplus$

Add or subtract. Remember to change subtraction to addition!

$-2 + 8 =$	$-8 + (-14) =$	$12 + (-20) =$
$-10 + 8 + (-3) =$	$15 + (-16) + 5 =$	$-8 + (-10) + (-2) =$
$5 - 18 =$	$-3 - 10 =$	$-5 - (-16) =$
$-6 + 2 - (-10) =$	$-5 - 9 - (-12) =$	$-1 + 7 - 15 =$



### Multiplying Integers Rules

$$\begin{array}{l} (+) \times (+) = (+) \\ (-) \times (-) = (+) \\ (+) \times (-) = (-) \\ (-) \times (+) = (-) \end{array}$$

### Rules for Dividing Integers

$$\begin{array}{l} (+) \div (+) = (+) \\ (-) \div (-) = (+) \\ (+) \div (-) = (-) \\ (-) \div (+) = (-) \end{array}$$

Multiply or divide.

$-4 \times 3 =$	$-8 \times (-5) =$	$12 \times (-8) =$
$-10 \times 2 \times (-1) =$	$-2 \times (-3) \times (-4) \times (-5)$	$4 \times 4 \times (-2) =$
$18 \div (-3) =$	$-24 \div (-12) =$	$-30 \div 2 =$
$-36 \div 6 \div (-2) =$	$-1 \div (-1) \div (-1) \div (-1)$	$-20 \div (-4) \div (-5) =$



# Week 8: Algebraic Expressions

## Evaluating Algebraic Expressions

1. Substitute the given numbers for the variables.
2. Evaluate the expression using the order of operations

ex: evaluate  $x + 4y$  for  
 $x = 4$  &  $y = 6$

$$\begin{aligned} &4 + 4(6) \\ &4 + 24 = \boxed{28} \end{aligned}$$

Evaluate each expression when  $a = 5$ ,  $b = 12$ ,  $c = 10$  and  $d = 2$

$2b - a$	$a(c - d)$	$3 + \frac{b}{d}$
$\frac{c}{d} - a$	$2a^2 - c$	$b - c + d$
$d^2 - ab$	$d(ab - c)$	$\frac{4a}{b+4d}$



# Week 9: Algebraic Equations

**Solving Equations**

Properties of Equality:

- To solve an equation, work backwards and use inverse operations.
- Apply the same move to both sides of the equation.

$1. \quad x + 3 = 10$ $\boxed{-3} \quad \boxed{-3}$ $x = 7$	$2. \quad x - 5 = 2$ $\boxed{+5} \quad \boxed{+5}$ $x = 7$
$3. \quad 9x = 18$ $\boxed{\div 9} \quad \boxed{\div 9}$ $x = 2$	$4. \quad \frac{x}{7} = 10$ $\boxed{\times 7} \quad \boxed{\times 7}$ $x = 70$

Solve the following equations. Use the Properties of Equality.

$g + 3 = 17$	$r - 6 = 7$	$6b = 18$	$\frac{h}{9} = 3$
$5 = f - 8$	$48 = 12b$	$10 = \frac{m}{5}$	$17 + x = 23$
$\frac{3}{4}x = 12$	$\frac{5}{12} + n = \frac{1}{6}$	$86.5 = f - 7.63$	$5b = 3.55$



# Student Reflection

1. How would you rate the difficulty of the problems in general throughout the summer break packet?  
Please rate on a scale from 1-10, with 1 being the easiest and 10 being the hardest.

1      2      3      4      5      6      7      8      9      10

2. What types of problems in the packet were the most difficult and why?
  
  
  
  
  
  
  
  
  
  
3. What types of problems in the packet were the easiest and why?
  
  
  
  
  
  
  
  
  
  
4. When did you complete the packet? How did you pace yourself when completing the packet? (Did you do it every day, once a week, all of it crammed into a few days?)

5. List at least 3 goals you have for 7th-grade math.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

6. Explain how you plan to achieve those goals.





**YAY!**  
**YOU DID IT!**



**CHECK YOUR WORK!**

Scan the QR code or go to  
<http://q-r.to/BVRMath7th>  
for the Answer Key.

