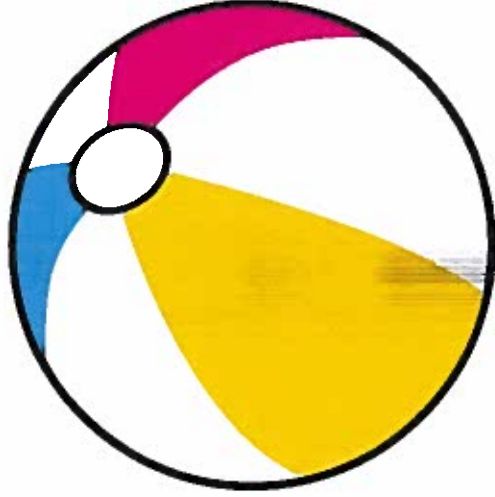
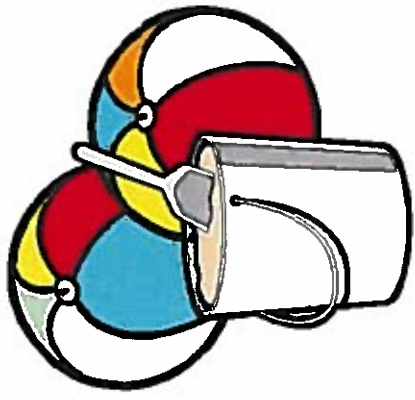
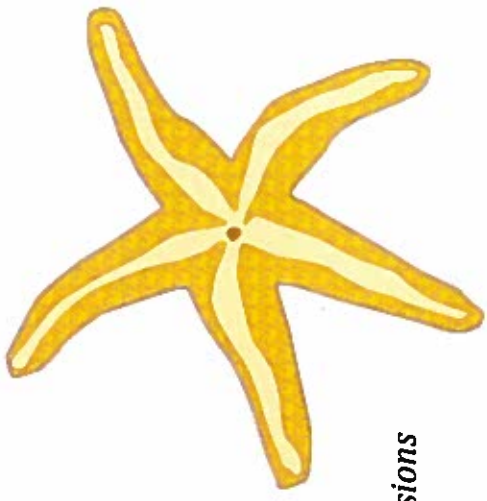


# 8<sup>th</sup> Grade Summer Mathematics Review Packet

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### **8<sup>th</sup> Grade Summer Mathematics Review Packet**

Please complete this chart as you complete the assignments. You may complete assignments in any order you like, as long as you stay on track to finish by the beginning of September. Good luck, and feel free to e-mail me with questions!

Assignment	Parent/Guardian Signature	Date Completed
Topic One: Adding and Subtracting Integers		
Topic Two: Multiplying and Dividing Integers.		
Topic Three: Order of Operations		
Topic Four: Solving On-step Equations		
Topic Five: Solving Two-Step Equations		
Topic Six: Area and Perimeter		
Topic Seven: Fraction - Decimal - Percent Conversions		
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## TOPIC ONE: ADDING AND SUBTRACTING INTEGERS

*Instructions:* Find the Sum or Difference **without using a calculator**. Calculators will not be allowed on the quiz in the fall. If you do work on a separate sheet of paper, please staple that sheet to this worksheet.

1.  $9 + -4$

8.  $-4 + 6 + 5$

2.  $-1 + -6$

9.  $-45 + -67$

3.  $2 + -6$

10.  $-13 + -4$

4.  $-14 + -7$

11.  $14 + -62$

5.  $5 + -10$

12.  $15 + -8$

6.  $13 + -12$

13.  $7 + -7$

7.  $12 + -4$

14.  $9 - (-1)$



15.5 - 8

20. -10 - (-8)

21. 11 - (-25)

22. -28 - 28

16.6 - 9

23. -28 - (-28)

17. -16 - (-2)

24. -36 - 29

18.27 - 52

25. 10 - (-14)

19. 19 - (-12)





## TOPIC TWO: MULTIPLYING AND DIVIDING INTEGERS

### Review

To multiply two integers, multiply their absolute values.

- If the signs are the same, the product is positive
- If the signs are different, the product is negative

To divide two integers, find the quotient of their absolute values.

- If the signs are the same, the quotient is positive
- If the signs are different, the quotient is negative

\* 'g' means multiply (x)

Instructions: Find the product or quotient **without using a calculator**. Calculators will not be allowed on the quiz in the fall. If you do work on a separate sheet of paper, please staple that sheet to this worksheet.

1.  $-3\cancel{6}$

7.  $-6\cancel{g}(-9)$

2.  $-50 \div 5$

8.  $-32 \div 4$

3.  $-7\cancel{g}0$

9.  $-18 \div 6$

4.  $6\cancel{g}(-7)$

10.  $-5\cancel{g}2$

5.  $-3\cancel{g}(-4)$

11.  $-45 \div 9$

6.  $-12 \div (-3)$

12.  $3\cancel{g}(-15)$



13.  $-64 \div 8$

20.  $-14 \div 7$

14.  $-54 \div (-9)$

21.  $-7 \cancel{g} \cancel{(-3)}$

15.  $-2 \cancel{g} \cancel{-8}$

22.  $-7 + 14$  (Different problem than #20)

16.  $-28 \div (-7)$

23.  $-6 \cancel{g} \cancel{\frac{1}{2}(-30)}$

17.  $-600 \div 30$

24.  $-6 \div \frac{1}{3}$

18.  $-8 \cancel{g} \cancel{-80}$

25.  $-1.5 \cancel{g}$

19.  $-0.4 \div (-1)$



### TOPIC THREE: ORDER OF OPERATIONS

When you have a number sentence that contains several operations, you use the order of operations to know which operation must be completed first.

1. Do all operations within parentheses first. This is called "clearing parentheses."
2. Perform all operations that involve exponents next.
3. Do multiplication and division **in the order that they appear from left to right**. There is no rule that multiplication comes before division. These two are on the same level. You have to make sure you work from left to right.
4. Do addition and subtraction **in the order that they appear from left to right**. Again, these two are on the same level. We don't add before we subtract – we do whichever of the two comes first, when reading from left to right. You have to make sure to work from left to right.

Example:  $8 + (3 + -5)^2 \cdot 3 - 4 + 6$

1.  $8 + 3^4$

4.  $5^3 + 56 + 7$

2.  $800 + 2^4 + 50$

5.  $(26 - 17)^2 + 35$

3.  $6(7^2 - 2^3)$

6.  $80 + (20 + 10)^2$



$$7. (5g)^2 - 75$$

$$13. (14 + 5^2)g^0$$

$$8. -15 + 4^3$$

$$14. 23 + (9 - 14)^2$$

$$9. -9^2 - (-30)$$

$$15. (14 - 16)^3 + 10$$

$$10. 3^4 + (40) - (5 - 3)^2$$

$$16. -4g(2 - 8)^2$$

$$11. 12^1g^0 - 8^2$$

$$17. (-7 - 8)^2g^0$$

$$12. 6^2 - 50g^2$$

$$18. -15 + 3 \cdot (-12)$$





## TOPIC FOUR: SOLVING ONE STEP EQUATIONS

There are five types of "one-step equations" that we learned to solve. In all cases, the goal is to "undo" whatever operation has been performed on the variable in order to get it alone. To do that, we just "undo" whatever has been done to the variable.

*Addition Equations:* To solve, we just subtract from both sides what was added to x.  
 $x + 7 = -12$

*Subtraction Equations:* To solve, we just add to both sides what was subtracted from x.  
 $x - 8 = 10$

*Multiplication Equations:* To solve, we just divide both sides by what multiplied x.  
 $5x = -25$

*Division Equations:* To solve, we just multiply both sides by what divided x.  
 $\frac{x}{3} = -7$

*Fractional Equations:* To solve, we just multiply both sides by the reciprocal of the fraction that multiplies x.

$$\frac{2}{3}x = 16$$

Instructions: Solve each equation, but undoing what has been done to the variable.

1.  $b + 15 = 8$

3.  $\frac{d}{5} = -10$

2.  $\frac{2}{7}d = -10$

4.  $-4b = 76$



$$5. z - 20 = 32$$

$$13. \frac{6}{5}x = 18$$

$$6. \frac{3}{7}x = 21$$

$$14. 22 = p - 14$$

$$7. -2 = 0.5 + c$$

$$15. 6p = -30$$

$$8. 7w = 280$$

$$16. x + 20 = 8$$

$$9. -\frac{4}{9}x = 16$$

$$17. p + 8 = -9$$

$$10. i - 9 = -19$$

$$18. -8 = 12 + q$$

$$11. -7 + h = 1$$

$$19. -49 = -7x$$

$$12. \frac{d}{-6} = -11$$

$$20. 25 + y = -10$$



## TOPIC FIVE: SOLVING TWO STEP EQUATIONS

The goal of solving two-step equations is simple: get the variable alone on one side of the equal sign. To do this we first undo addition or subtraction, and then we undo multiplication or division.

Solve each equation. Then check your solution.

*Example:*

$$10 = 3x + 1$$

$$-1 \quad -1 \text{ (Subtract 1 from both sides)} \Rightarrow$$

$$9 = 3x \text{ (To get } x \text{ alone, divide both sides by 3)}$$

$$\frac{9}{3} = \frac{3x}{3} \Rightarrow$$

$$3 = x$$

To check the solution, substitute it into the original equation for  $x$ :

If we are correct and  $x=3$ , then

$$3x + 1 \text{ must equal}$$

$$3(3) + 1 = 9 + 1 = 10$$

Because our original equation was  $3x + 1 = 10$ , and when we checked our answer we got 10, we know we solved correctly.

**Instructions:** Solve each equation. Then check your solution by plugging it into the original equation in place of the variable. Because there are two steps to each problem, I have only given you 10 problems to complete.

1.  $-2 = 10d - 3$

3.  $-8 + 2g = 4$

2.  $7 = -2 + 3b$

4.  $-3 - 5n = -1$



$$5. 2x + 8 = -6$$

$$10. -12 = \frac{m}{4} - 9$$

$$6. \frac{h}{-3} - 6 = 8$$

$$7. \frac{k}{5} + 11 = -4$$

$$8. 7 + \frac{c}{-6} = -3$$

$$9. -1 = -4 + \frac{e}{8}$$





## TOPIC SIX: AREA AND PERIMETER

The **perimeter** of a shape is the sum of the lengths of its sides. To find the perimeter, you simply add the lengths of the figure's sides. Remember to always write units – your answer should never be just a number!

The **area** of a shape is the amount of space it takes up. Use the formula sheet included in this review packet to help you with this activity. These formulas should be committed to memory, so that you can recall them quickly. **I expect everyone will have these memorized by the beginning of the year.**

### Instructions.

1. Draw each figure. **You do not have to use a ruler, a rough sketch is fine.**
  2. Find the Perimeter of the figure.
  3. Find the Area of the figure.
1. Rectangle with length 8 cm and width 6 cm.
  2. A parallelogram with base 12 inches and height 7 inches.
  3. A square with sides 14 m.
  4. A triangle with base 16 cm and height 9 cm.
  5. A trapezoid with one base of 3 feet, another base of 8 feet, and a height of 6 feet.



## TOPIC SEVEN: FRACTION – DECIMAL – PERCENT CONVERSIONS

A percent is a special fraction with a denominator of 100. We practiced going back and forth between percents, decimals, and fractions in 7<sup>th</sup> grade. Here is a quick review.

- 35% is the same as  $\frac{35}{100}$  which is the same as 0.35
- To convert a decimal into a percent, multiply it by 100.  
 $0.64 \rightarrow 0.64(100) = 64\%$ 
  - $1.05 \rightarrow 1.05(100) = 105\%$
  - $0.05 \rightarrow 0.05(100) = 5\%$
- To convert a percent into a decimal, divide it by 100.  
 $89.5\% \rightarrow 89.5 \div 100 = 0.895$ 
  - $107\% \rightarrow 107 \div 100 = 1.07$
  - $0.03\% \rightarrow 0.03 \div 100 = 0.0003$
- To convert a fraction into a percent, first write it the fraction as a decimal by dividing the numerator by the denominator. Then multiply that decimal by 100 to get a percent.
  - To convert  $\frac{1}{4}$  into a percent, first we write it as a decimal:  $1 \div 4 = 0.25$   
Next we convert the decimal into a percent  $0.25 \rightarrow 0.25(100) = 25\%$
  - To convert a percent into a fraction, first write it as a decimal. Then write that decimal as a fraction. Finish by reducing the fraction.  
 $50\% = 0.50 \rightarrow \frac{50}{100}$ 
    - Now we reduce  $\frac{50}{100}$  by dividing both the numerator and denominator by a "fancy 1" =  $\frac{50}{50}$

$$\frac{50}{100} \div \frac{50}{50} = \frac{1}{2}$$

Write each decimal as a percent and as a fraction reduced to simplest form.

1. 0.36

3. 0.003

2. 0.04

4. 5.2



Write each fraction as a decimal and as a percent. Use a calculator to help with division if needed.  
**You may use a calculator on this section if you wish.**

1.  $\frac{3}{5}$

3.  $\frac{1}{6}$

2.  $\frac{17}{20}$

4.  $\frac{25}{8}$

Write each percent as a decimal and as a fraction reduced to simplest form.

1. 70%

3.  $4\frac{3}{4}\%$

2. 93%

4. 782%



## TOPIC EIGHT: OPERATIONS ON FRACTIONS

This is a topic I expect everyone to master by the beginning of eighth grade! Use whatever resources you have to become an expert on these operations. **These will be on the high school entrance exam, and you will not be allowed to use a calculator! Please keep that in mind while completing this worksheet.**

1.  $\frac{6}{7} - \frac{1}{2}$

5.  $\frac{15}{4} + \frac{9}{5}$

2.  $\frac{2}{5} - \frac{1}{3}$

6.  $5\frac{1}{10} - 2\frac{1}{3}$

3.  $\frac{3}{5} \times \frac{5}{6}$

7.  $1\frac{1}{4} \times 1\frac{1}{3}$

4.  $\frac{2}{3} + \frac{4}{7}$

8.  $\left(4\frac{1}{3} - 2\frac{3}{4}\right) \times 1\frac{1}{2}$





Simplify the following fractions. This is a skill at which you should become an expert. Your goal is to get yourself to a point (by September) where these problems come naturally for you.

1.  $\frac{12}{45}$

2.  $\frac{20}{15}$

3.  $\frac{18}{51}$

4.  $\frac{42}{64}$

5.  $\frac{25}{80}$

6.  $\frac{60}{24}$

7.  $\frac{15}{75}$

8.  $\frac{32}{12}$



## TOPIC NINE: PROPORTIONS

We have learned two ways of solving proportions: cross-multiplication and finding scale factor. Please try to complete these BOTH ways. Again, if you need help, check out Khan Academy or Google it!

Scale factor method:

$$1) \frac{10}{8} = \frac{n}{10}$$

$$3) \frac{9}{6} = \frac{x}{10}$$

$$5) \frac{4}{3} = \frac{x}{x}$$

Cross-multiplication method:

$$2) \frac{7}{5} = \frac{x}{3}$$

$$4) \frac{7}{n} = \frac{8}{7}$$

$$6) \frac{7}{b+5} = \frac{10}{5}$$



## TOPIC TEN: AN ASSORTMENT OF WORD PROBLEMS

For these problems, please show your work when necessary. They are an assortment of challenge questions, logic puzzles, and open response questions. Have fun with them!

1. Denny and Brendan decide to start a paper delivery business to make money over the summer. Use **tables, graphs, or equations** to help you solve!
  - a. Denny can deliver 6 papers every 15 minutes and Brendan can deliver 5 papers in that same amount of time. How many papers can they deliver in an hour?
  - b. In Brighton, 90 homes receive papers each day. When would Brendan and Denny need to wake up to deliver all their papers by 8am?
  - c. On Sunday, Brendan and Denny can sometimes talk Will into helping them with the deliveries. His delivery rate is 8 papers every 15 minutes. How much longer could they sleep if they could convince Will to help?
2. There were 6 pizza pies at the summer barbeque at Gioia's house. She shares the pizza with her 7 friends. If all 8 people get the same amount of pizza, how much pizza can each person have? *Use pictures, diagrams, or math operations to show your work.*
3. The class decides to make chocolate chip cookies for Ms. Zagar's first day of school in September. Each student needs  $\frac{3}{4}$  of a stick of butter for the recipe. If 14 students want to make cookies, how many sticks of butter do they need to buy? *Use pictures, diagrams, or math operations to show your work.*



4. Maeve's family recipe for macaroni and cheese makes 4 servings of 310 calories each. Maeve decided to make  $1\frac{1}{2}$  times the amount in the recipe. How many calories are in Maeve's batch of macaroni and cheese?
5. If 1 bucket + 5 jars = 1 tub, and 3 buckets + 2 jars = 2 tubs, how many jars are equal to 1 tub?
6. If  $x \otimes y$  is defined as  $xy + (x - y)$ , what is the value of  $4 \otimes 2$ ?
7. Arlene has  $\frac{1}{3}$  as many goldfish as Isabelle. Isabelle has 5 times as many goldfish as Anaele. If Anaele has 18 goldfish, how many goldfish does Arlene have?
8. Meaghan started a baking service. During her first month in business, Meaghan spent \$380 on supplies and drove 800 miles at an average cost of \$0.30 per mile. In addition, her business phone and other expenses were \$198. That month, Meaghan completed 60 jobs, earning \$50 per job. What was Meaghan's **profit** during her first month in business? Show all your work!!!





“FLOWERS FOR ALGERNON”  
8<sup>TH</sup> GRADE SUMMER READING PROJECT 2019

INSTRUCTIONS

- After reading “Flowers for Algernon,” choose a character to interview.
- Write 10 questions to ask your character, and write answers based on how your character might respond.
- Fill out the Planning Page to help you focus your questions
- Type or write neatly using lined paper
- Create a cover page for your interview that includes the book title, author, and a picture (drawn or collaged) that represents the book.
- Interviews and cover sheets will be graded using the attached rubric.



## INTERVIEW A CHARACTER FROM "FLOWERS FOR ALGERNON"

1. Think of 10 questions that are relevant to the story that you would like to ask your favorite character.

2. Write answers to the questions based on how the character would most likely answer them. Think about how the author describes the character's personality because it may give you insight into how the character would answer. For example, if your character is a teenager, he or she might answer a question using different language than an adult. A bully might use different language than a shy character, too.

3. Questions and answers must be written in this format:

Interviewer: *This is the question you ask your character.*

Character Name: *This is the answer the character would give.*

4. Here are examples of some question starters: *Describe... Do you agree that... What do you think about... What is most important to you... How did you decide about... What might happen if... What solutions would you suggest... What is the significance of... How do you feel about...*



## INTERVIEW PLANNING PAGE

Character: Who is the main character (protagonist)? Who is your character? What details and specific facts would reveal the most about your character and other characters?

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Personality: What character personality traits are you going to include in your interview (ex: anger, shyness, bravery)

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Summary: What important events from the story are you going to highlight?

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Cover page art: What pictures or images can you look for that will relate to the theme/purpose of the book? What pictures will help someone reading your interview be more interested in your book?

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## Rubric

	4	3	2	1
Number of questions and answers	10 questions and answers were written.	8-9 questions were written.	5-7 questions were written.	0-4 questions were written
Chapter or page numbers were given.	Chapter or page # included for every question and answer	Chapter or page # included for most question and answer	Chapter or page # NOT included for most question and answer	NO chapter or page # given.
Questions asked shows that you understand the character's role in the plot of the story.	<u>All</u> questions asked about situations or events that were important to the plot. Questions are from entire book.	<u>Most</u> questions asked about situations or events that were important to the plot. Questions came from most of the book.	<u>Many</u> questions asked about <u>unimportant</u> events or <u>minor</u> details. The questions only came from one part of the book.	Questions were <u>unclear</u> , <u>unimportant</u> , <u>confusing</u> , or did not show your understanding of the plot. Could not confirm if questions came from the book or not.
Character's answers shows that you understand the character's role in the plot of the story.	Character's answers had <u>important</u> , <u>specific</u> details. All questions were answered.	Character's answers had <u>enough</u> details. 1-2 questions were missing.	Character's answers had <u>limited</u> details, making it difficult to make connections. Some answers were missing.	Character's answers were too <u>unclear</u> or <u>confusing</u> . Answers did not answer the questions. Many missing answers. No answers.
Mechanics: spelling, sentence structure, capitalization, and punctuation	Only <u>minor</u> errors were made	A <u>few</u> errors were made, did not interfere with understanding	<u>Several</u> errors were made, making understanding difficult at times	<u>Many</u> errors were made, making understanding very difficult

