

Incoming Grade 7 Summer Math Packet: Memorial Middle School 2022-2023

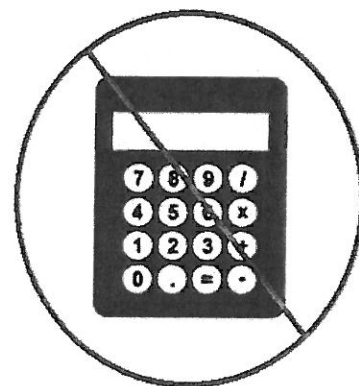
Dear Incoming Grade 7 Math Students,

Summer work is assigned to ensure an easier transition between 6th and 7th grade, and to keep your math skills sharp over the summer. The expectation is that all students bring the completed assignment on the first day of school. You will be given one reminder, then points will be deducted for each day the packet is late.

The idea is to do the packet throughout the summer, not complete it all in June or during the last few days of August.

If you need help completing the problems, you have a couple of options:

- Review the examples at the top of each page of the packet.
- Ask a friend/parent/guardian/sibling for help!
- Visit some helpful websites like...
 - Khan Academy
 - Virtual Nerd
- Email Mrs. Tannuzzo @ ltannuzzo@hullpublicschools.us



All problems are non-calculator problems.

All answers must show work!!!

Grading Rubric

Complete all parts of the packet for full credit:

- ☐ Completed/initialed Summer Math Packet Log
- ☐ Content Pages
 - All problems attempted
 - All work shown
- ☐ Reflection Page
- ☐ Extra Credit Page
- ☐ **2 points per day will be deducted packets that are late beyond one day**

Name _____

Parent/Guardian Signature: _____

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Summer Math Packet Log

Directions: Record the date and number of minutes spent on this packet each time you work on it in the table below. Have a parent/guardian initial each time you work on the packet 😊

[illegible]

Calculating Unit Rates

A **rate** is a ratio of two measurements having different kinds of units. When a rate is simplified so that it has a denominator of 1, it is called a **unit rate**. You can find a unit rate by dividing.

Example

Benito ate 48 raisins in 8 minutes. How many raisins did he eat per minute, if he ate the same number each minute?

$$\frac{48 \text{ raisins}}{8 \text{ minutes}} = \frac{6 \text{ raisins}}{1 \text{ minute}}$$

(Note: In the original image, curved arrows indicate dividing both the numerator and denominator by 8.)

Divide the numerator and denominator by 8 to get a denominator of 1.

The unit rate is 6 raisins per minute.

Exercises

Calculate the unit rate in each scenario. Write your answer in a complete sentence.

1. 6 eggs for 3 people
2. \$12 for 4 pounds
3. 40 pages in 8 days

4. **GROCERIES** Mr. Gonzalez spends \$135 for 5 bags of groceries. How much does he spend per bag of groceries, if each bag costs the same?

5. **TRAIN** Ms. Terry travels by train to see famous theme parks. She travels a distance of 728 miles in 8 hours. If the train maintains a constant speed, how many miles does she travel in one hour?

6. **FOOTBALL** A quarterback throws 222 yards in 6 games. How many yards does he throw in one game if he throws the same amount in each game?

7. **CLOTHING** It costs \$15.24 for 4 t-shirts. What is the cost per t-shirt?

Ratio and Rate Problems

You can solve rate and ratio problems by using a **bar diagram** or by using a **unit rate**.

Examples

Three servings of broccoli contain 150 Calories. How many Calories will 5 servings contain?

Method 1 Use a bar diagram.

50	50	50	= 150 calories
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50	50	50	50	50	? Calories
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Draw a bar diagram to represent the situation.

Each section represents $150 \div 3$, or 50 Calories.

So, 5 servings of broccoli contain 250 Calories.

Method 2 Use a unit rate.

Step 1 Find the unit rate. $\frac{150 \text{ Calories}}{3 \text{ servings}} = \frac{\text{? Calories}}{1 \text{ serving}}$ $\frac{150 \text{ Calories}}{3 \text{ servings}} = \frac{50 \text{ Calories}}{1 \text{ serving}}$

Step 2 Multiply. $\frac{50 \text{ Calories}}{1 \text{ serving}} \times 5 \text{ servings} = 250 \text{ Calories}$

Exercises

Solve each problem using one of the methods reviewed above. Show your work.

- MUSIC** Jeremy spent \$33 on 3 CDs. At this rate, how much would 5 CDs cost?
- AQUARIUM** At an aquarium, 6 out of 18 deliveries are plants. Out of 15 deliveries in one week, how many are plants?
- ELECTIONS** Three out of four students surveyed in a school said they will vote for Nuncio for class president. Predict how many of the 340 students in the school would vote for Nuncio.
- STRAWBERRIES** At a local fruit stand, Luisa spends \$3.96 for 2 pounds of strawberries. How much can she expect to pay for 4 pounds of strawberries?
- POGO STICK** On her pogo stick, Lula made 24 hops in 30 seconds. At this rate, how many hops will she make in 50 seconds?
- TESTS** On a test, Matilda answered 12 out of the first 15 problems correctly. If this rate continues, how many of the next 25 problems will she answer correctly?

Divide Multi-Digit Numbers

When one number is divided by another, the result is called a *quotient*. The *dividend* is the number that is divided and the *divisor* is the number used to divide another number.

Example

Find $592 \div 30$.

Estimate $592 \div 30 \approx 600 \div 30$ or 20.

$$\begin{array}{r} 19 \text{ R}22 \\ 30 \overline{) 592} \\ \underline{-30} \\ 292 \\ \underline{-270} \\ 22 \end{array}$$

Divide each place-value position from left to right.

Since $292 - 270 = 22$ and $22 < 30$, 22 is the remainder.

The quotient is 19 R22.

Exercises

Find each quotient.

1. $595 \div 23$

2. $874 \div 38$

3. $554 \div 23$

4. $925 \div 58$

5. $1,894 \div 62$

6. $1,089 \div 59$

7. $3,604 \div 85$

8. $379 \div 74$

Adding and Subtracting Decimals

Example 1

Find the sum of 3.25 and 12.6.

Estimate $3.25 + 12.6 \approx 3 + 13$ or 16.

$$\begin{array}{r} 3.25 \\ + 12.60 \\ \hline \end{array}$$

Line up the decimal points. Annex a zero so that both numbers have the same number of decimal places.

$$\begin{array}{r} 3.25 \\ + 12.60 \\ \hline 15.85 \end{array}$$

Add as you would add whole numbers. Place the decimal point.

The sum is 15.85.

Example 2

Find the difference of 26.82 and 12.15.

Estimate $26.82 - 12.15 \approx 27 - 12$ or 15.

$$\begin{array}{r} 26.82 \\ - 12.15 \\ \hline \end{array}$$

Line up the decimal points.

$$\begin{array}{r} 26.82 \\ - 12.15 \\ \hline 14.67 \end{array}$$

Subtract as with whole numbers.

The difference is 14.67.

Exercises

Find each sum or difference. Show all of your work.

1. $3.1 + 9.4$

2. $4.88 + 8.1$

3. $14.05 + 9.2$

4. $6.008 + 0.22$

5. $5 - 3.12$

6. $75.23 - 50.09$

7. $9 - 7.7$

8. $0.62 - 0.35$

Multiply Decimals by Decimals

When you multiply a decimal by a decimal, multiply the numbers as if you were multiplying all whole numbers. To decide where to place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.

Example 1

Find 5.2×6.13 .

Estimate: 5×6 or 30

$$\begin{array}{r} 5.2 \quad \leftarrow \text{one decimal place} \\ \times 6.13 \quad \leftarrow \text{two decimal places} \\ \hline 156 \\ 52 \\ +312 \\ \hline 31.876 \quad \leftarrow \text{three decimal places} \end{array}$$

The product is 31.876.
Compared to the estimate, the product is reasonable.

Example 2

Find 2.3×0.02 .

Estimate: 2×0.02 or 0.04

$$\begin{array}{r} 2.3 \quad \leftarrow \text{one decimal place} \\ \times 0.02 \quad \leftarrow \text{two decimal places} \\ \hline 0.046 \quad \leftarrow \text{Annex a zero to make three decimal places.} \end{array}$$

The product is 0.046.
Compared to the estimate, the product is reasonable.

Exercises

Multiply.

1. 7.2×2.1

2. 4.3×8.5

3. 2.64×1.4

4. 14.23×8.21

5. 5.01×11.6

6. 9.001×4.2

7. 3.24×0.008

8. 0.012×2.9

9. 0.9×11.2

Divide Decimals by Decimals

When you divide a decimal by a decimal multiply both the divisor and the dividend by the same power of ten. Then divide as with whole numbers.

Example 1

Find $10.14 \div 5.2$.

First, estimate: $10 \div 5 = 2$

Multiply by 10 to make a whole number.

$$5.2 \overline{)10.14}$$

Multiply by the same number, 10.

$$\begin{array}{r} 1.95 \\ 52 \overline{)101.40} \\ \underline{-52} \\ 494 \\ \underline{-468} \\ 260 \\ \underline{-260} \\ 0 \end{array}$$

Place the decimal point.

Divide as with whole numbers.

Annex a zero to continue.

Compare the quotient with the estimate.

10.14 divided by 5.2 is 1.95 .

Check $1.95 \times 5.2 = 10.14 \checkmark$

Exercises

Divide. Show all work and circle your final answer.

1. $9.8 \div 1.4$

2. $4.41 \div 2.1$

3. $16.848 \div 0.72$

4. $8.652 \div 1.2$

5. $0.5 \div 0.001$

6. $9.594 \div 0.06$

Add and Subtract Unlike Fractions

To add or subtract fractions with different denominators,

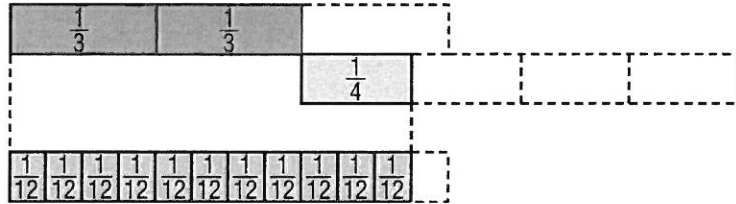
- Rename the fractions using the least common denominator (LCD).
- Add or subtract as with like fractions.
- If necessary, simplify the sum or difference.

Example

Find $\frac{2}{3} + \frac{1}{4}$.

Method 1 Use a model.

$$\begin{array}{r} \frac{2}{3} \\ + \frac{1}{4} \\ \hline \frac{11}{12} \end{array}$$



Method 2 Use the LCD.

$$\begin{aligned} \frac{2}{3} + \frac{1}{4} &= \frac{2}{3} \cdot \frac{4}{4} + \frac{1}{4} \cdot \frac{3}{3} \\ &= \frac{8}{12} + \frac{3}{12} \text{ or } \frac{11}{12} \end{aligned}$$

Rename using the LCD, 12.

Add the fractions.

Exercises

Add or subtract. Write in simplest form.

1. $\frac{1}{2} + \frac{3}{4}$

2. $\frac{5}{8} - \frac{1}{2}$

3. $\frac{7}{15} + \frac{5}{6}$

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

5. $\frac{5}{9} + \frac{5}{12}$

6. $\frac{11}{12} - \frac{3}{4}$

7. $\frac{7}{8} - \frac{1}{3}$

8. $\frac{7}{9} - \frac{1}{2}$

9. $\frac{3}{10} + \frac{7}{12}$

10. $\frac{3}{5} + \frac{2}{3}$

Add and Subtract Mixed Numbers

To add or subtract mixed numbers:

- Add or subtract the fractions. Rename using the LCD if necessary.
- Then, add or subtract the whole numbers.
- Simplify if necessary.

Example 1

Find $6\frac{1}{10} + 2\frac{3}{10}$. Write in simplest form.

$$\begin{array}{r} 6\frac{1}{10} \\ + 2\frac{3}{10} \\ \hline \end{array}$$

$$8\frac{4}{10} \text{ or } 8\frac{2}{5}$$

Add the whole numbers and the fractions separately.

Simplify.

Example 2

Find $8\frac{2}{3} - 6\frac{1}{2}$.

$$8\frac{2}{3} \rightarrow 8\frac{4}{6}$$

$$\begin{array}{r} -6\frac{1}{2} \rightarrow -6\frac{3}{6} \\ \hline \end{array}$$

$$2\frac{1}{6}$$

Rename the fractions using the LCD.

Subtract.

Example 3

Find $4\frac{1}{4} - 2\frac{3}{5}$.

$$4\frac{1}{4} \rightarrow 4\frac{5}{20} \rightarrow 3\frac{25}{20}$$

$$\begin{array}{r} -2\frac{3}{5} \rightarrow -2\frac{12}{20} \\ \hline \end{array}$$

$$1\frac{13}{20}$$

Rename $4\frac{5}{20}$ as $3\frac{25}{20}$.

Subtract the whole numbers and then the fractions.

Exercises

Add or subtract. Write in simplest form.

1. $1\frac{3}{5} + 4\frac{1}{5}$

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

3. $3\frac{2}{3} + 2\frac{1}{2}$

4. $5\frac{3}{4} - 3\frac{1}{6}$

5. $8 - 6\frac{7}{8}$

6. $1\frac{4}{5} + \frac{3}{10}$

Divide Fractions

You can use reciprocals to divide fractions. To divide by a fraction, multiply by its reciprocal.

Example 1

Find $\frac{1}{2} \div \frac{1}{5}$.

$$\frac{1}{2} \div \frac{1}{5} = \frac{1}{2} \times \frac{5}{1}$$

$$= \frac{5}{2} \text{ or } 2\frac{1}{2}$$

Multiply by the reciprocal, $\frac{5}{1}$.

Multiply numerators and denominators.

Example 2

Find $\frac{2}{3} \div \frac{4}{5}$.

$$\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4}$$

$$= \frac{\cancel{2}^1 \times 5}{3 \times \cancel{4}_2}$$

$$= \frac{5}{6}$$

Multiply by the reciprocal, $\frac{5}{4}$.

Divide 2 and 4 by the GCF, 2.

Multiply numerators and denominators.

Exercises

Divide. Cross-Simplify where you can after using the reciprocal. Write answers in simplest form.

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

2. $\frac{1}{9} \div \frac{1}{2}$

3. $\frac{2}{3} \div \frac{1}{4}$

4. $\frac{1}{2} \div \frac{3}{4}$

5. $\frac{4}{5} \div \frac{1}{2}$

6. $\frac{4}{5} \div \frac{1}{10}$

7. $\frac{5}{12} \div \frac{5}{6}$

8. $\frac{9}{10} \div \frac{1}{3}$

9. $\frac{3}{4} \div \frac{7}{12}$

10. $\frac{9}{10} \div \frac{1}{9}$

11. $\frac{2}{3} \div \frac{5}{8}$

12. $\frac{3}{4} \div \frac{7}{9}$

13. $\frac{1}{2} \div 2$

14. $\frac{5}{6} \div 15$

15. $\frac{3}{8} \div \frac{3}{4}$

16. $\frac{7}{10} \div \frac{5}{7}$

Multiply Mixed Numbers

To multiply mixed numbers, write the mixed numbers as improper fractions and then multiply as with fractions.

Example 1

Find $\frac{1}{4} \times 1\frac{2}{3}$.

Estimate. Use compatible numbers. $\frac{1}{2} \times 2 = 1$

$$\begin{aligned}\frac{1}{4} \times 1\frac{2}{3} &= \frac{1}{4} \times \frac{5}{3} \\ &= \frac{1 \times 5}{4 \times 3} \\ &= \frac{5}{12}\end{aligned}$$

Write $1\frac{2}{3}$ as $\frac{5}{3}$.

Multiply.

Simplify. Compare to the estimate.

Example 2

Find $1\frac{1}{3} \times 2\frac{1}{4}$.

$$\begin{aligned}1\frac{1}{3} \times 2\frac{1}{4} &= \frac{4}{3} \times \frac{9}{4} \\ &= \frac{\cancel{4}^1}{\cancel{3}_1} \times \frac{\cancel{9}_3}{\cancel{4}_1} \\ &= \frac{3}{1} \text{ or } 3\end{aligned}$$

Convert mixed numbers to improper fractions.

Divide the numerator and denominator by their common factors, 3 and 4. (**Cross-simplify**)

Write answer in simplest form.

Exercises

Multiply. Write in simplest form.

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

2. $1\frac{1}{5} \times \frac{3}{4}$

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

4. $\frac{2}{3} \times 3\frac{1}{2}$

5. $\frac{2}{9} \times 1\frac{1}{6}$

6. $2\frac{4}{9} \times \frac{4}{11}$

7. $2\frac{1}{2} \times 1\frac{1}{3}$

8. $1\frac{1}{4} \times 3\frac{3}{5}$

9. Find the product of $\frac{1}{5}$ and $3\frac{1}{3}$.

10. Simplify $4\frac{2}{3} \times 1\frac{1}{4}$.


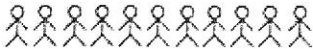


Calculating the Mean


The **mean** of a data set is the sum of the data divided by the number of pieces of data.

Example

The pictograph shows the number of members on four different swim teams. Find the mean number of members for the four different swim teams.

$$\begin{aligned}\text{mean} &= \frac{9 + 11 + 6 + 10}{4} \\ &= \frac{36}{4} \text{ or } 9\end{aligned}$$

Swim Team Members	
Amberly	
Carlton	
Hamilton	
West High	

Key:  1 swimmer

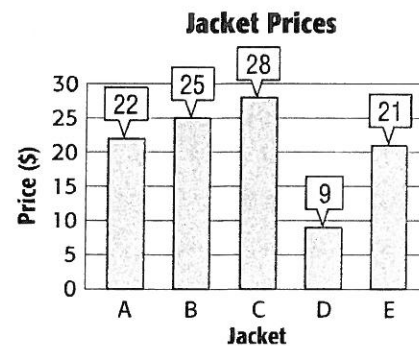
Exercises

Find the mean for each set of data.




1.

Month	Snowfall (in.)
Nov.	20
Dec.	19
Jan.	20
Feb.	17
Mar.	4

2.







3.

Number of Bicycles	
Smiths	
Castros	
Lius	

Key:  1 bicycle

4.

Checker Pieces	
A	
B	
C	
D	

Key:  1 checker piece

Calculating the Median and Mode

The **median** of a list of values is the value appearing at the center of a sorted version of the list, or the mean of the two central values, if the list contains an even number of values.

The **mode** is the number or numbers that occur most often.

Example

The table shows the costs of seven different books.

Find the mean, median, and mode of the data.

$$\text{Mean: } \frac{22 + 13 + 11 + 16 + 14 + 13 + 16}{7} = \frac{105}{7} \text{ or } 15$$

Book Costs (\$)			
22	13	11	16
14	13	16	

To find the median, write the data in order from least to greatest.

Median: 11, 13, 13, 14, 16, 16, 22

To find the mode, find the number or numbers that occur most often.

Mode: 11, 13, 13, 14, 16, 16, 22

The mean is \$15. The median is \$14. There are two modes, \$13 and \$16.

Exercises

Find the mean, median, and mode of each set of data.

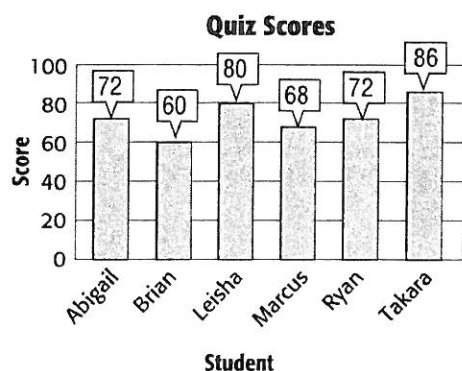
1. hours worked: 14, 13, 14, 16, 8

2. points scored by a football team:
29, 31, 14, 21, 31, 22, 20

3. miles ran: 5, 4, 9, 1, 6

4. ages of contestants:
27, 21, 22, 22, 24, 20, 25, 24

5.



6.

Snowfall (in.)					
0	2	2	3	3	3
5	5	6	7	8	

EXTRA CREDIT: Area of Composite Figures

To find the area of a composite figure, separate it into figures whose areas you know how to find, and then add the areas.

Example

Find the area of the figure at the right in square feet.

The figure can be separated into a rectangle and a trapezoid. Find the area of each.

Area of Rectangle

$$A = \ell w$$

Area of a rectangle.

$$A = 12 \cdot 8$$

Replace ℓ with 12 and w with 8.

$$A = 96$$

Multiply.

Area of Trapezoid

$$A = \frac{1}{2}h(b_1 + b_2)$$

Area of a trapezoid

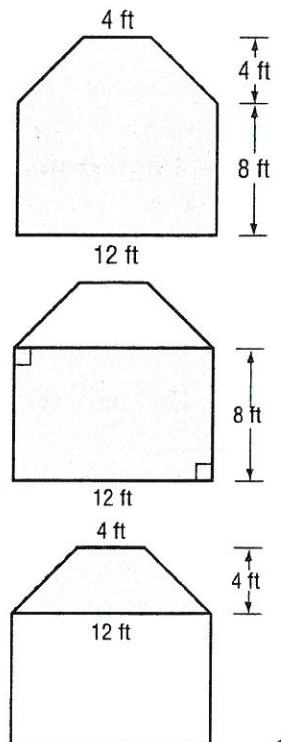
$$A = \frac{1}{2}(4)(4 + 12)$$

Replace h with 4, b_1 with 4, and b_2 with 12.

$$A = 32$$

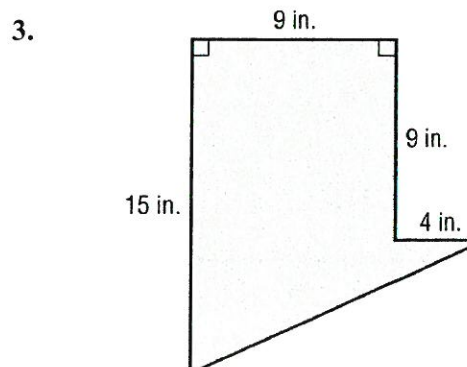
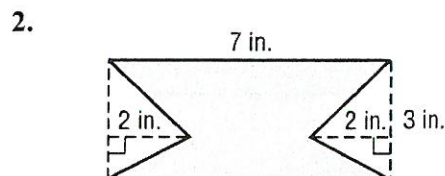
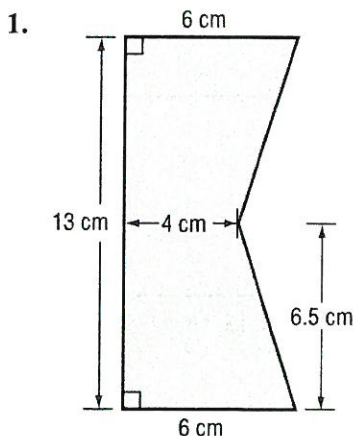
Multiply.

The area of the figure is $96 + 32$ or 128 square feet.



Exercises

Find the area of each figure. Round to the nearest tenth if necessary.



Summer Math Packet Reflection

Name _____

After completing your Summer Math Packet, please answer the following questions:

- 1) List the Math skills and concepts that you are **most confident** with. In other words, which problems were the **easiest** for you to solve? (example... order of operations)

- 2) List the Math skills and concepts that you found to be the most **difficult**. In other words, which problems were the **hardest** for you to solve? (example... dividing decimals)

- 3) What are your **expectations for Math class this year**? What do you expect to learn? What do you expect Math class to be like?

- 4) Write **two personal Math goals** to strive towards this school year.

For example...

This year in Math class, I hope to memorize my Math facts.

I also want to get better at solving word problems.
