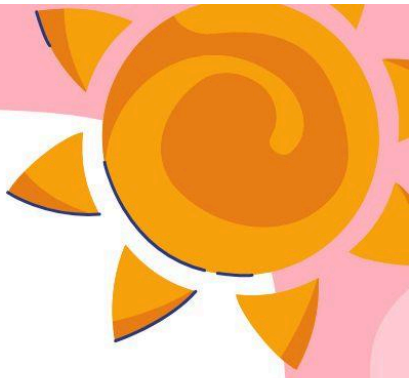
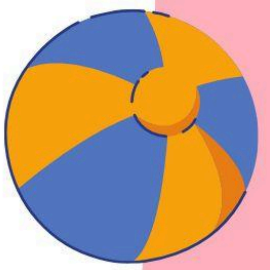




SUMMER MATH PACKET

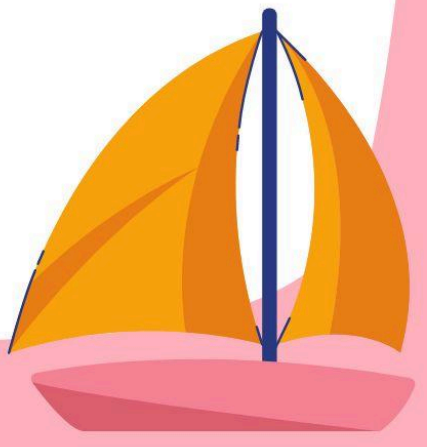


For students entering

Pre-Algebra I





For Students Entering 6th/7th Grade Pre-Algebra I

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Write Numbers in Words and Digits

Hints/Guide:

In order to read numbers correctly, we need to know the order of each place value. The order is the following:

1,000,000 → one million	100,000 → one hundred thousand	10,000 → ten thousand	1,000 → one thousand	100 → one hundred
10 → ten	1 → one	0.1 → one tenth	0.01 → one hundredth	0.001 → one thousandth

So, the number 354.67 is read as, "three hundred fifty four and sixty-seven hundredths" and 3,500,607.004 is read as, "three million, five hundred thousand, six hundred seven and four thousandths." Please remember that the word "and" indicates the location of a decimal point in mathematics and should not be used anywhere else (for example, it is not correct to read 350 as "three hundred AND fifty," because "and" means a decimal point). Also, the term, "point," in mathematics is a geometry term and should not be used in naming numbers (for example, 3.5 is not three "point" five, but rather three and five tenths).

Exercises:

Write the number in word form.

1. 560.08 _____
2. 7.016 _____
3. 24.47 _____
4. 6,003 _____
5. 3,005,600.07 _____

Write the number in standard form (the number the name represents).

6. Forty-five thousandths _____

7. Seventeen and seven hundredths _____

8. Five million, three hundred thousand, twenty-nine and six tenths _____

9. Six million and five thousandths _____

10. Two hundred eight thousand, four _____

Order Decimals

Hints/Guide:

To compare decimals and list them from least to greatest, it is easier to compare decimals that are the same place value. One process we can use to compare decimals is to include trailing zeros to make all of the decimals the same place value. For example, to put the following in order from least to greatest:

$0.3,\ 1.61, 0.006,\ 0.107 \rightarrow$ it's easier to compare these as:

$0.300,\ 1.610,\ 0.006,\ 0.107$ to achieve a correct order of $0.006,\ 0.107,\ 0.300,\ 1.610.$

and then return to the original form: $0.006,\ 0.107,\ 0.3,\ 1.61$

Exercises: **List each group of numbers in order from least to greatest.**

1. 20, 4, 0.6, 0.08

_____

2. 246.8, 248.6, 244.9, 246.5

_____

3. 1.03, 2.4, 0.89, 0.987

_____

4. 14.8, 2.68, 0.879, 8.47

_____

5. 5.3, 5.12, 5.38, 5.29

_____

6. 54.89, 3.456, 64.4, 7.24

_____

7. 4, 0.006, 0.8, 0.07

8. 297, 3.456, 64.4, 7.24

9. 794, 793.8, 794.65, 794.7

10. 9, 6.7, 7.24, 14

11. 4.2, 4.19, 4.07, 4.3

12. 3.75, 6.7, 3.8, 0.45

Add and Subtract Whole Numbers

Hints/Guide:

The key in adding and subtracting whole numbers is the idea of regrouping. If a column adds up to more than ten, then the ten digits of the sum needs to be included in the next column (the column to the left). Here is an example of the steps involved in adding:

	1	11	11
792	792	792	792
+158	+158	+158	+158
	0	50	950

For subtraction, regrouping involves transferring an amount from a higher place value to a lesser place value. For example →

$$\begin{array}{r} {\scriptstyle 3\ 4\ 1} \\ 4\not{5}\not{0} \\ -\ 178 \\ \hline 172 \end{array}$$

Exercises: **Solve. Show all work. No Calculators!**

1. 6,496 + 4,113 + 3,608

2. 54,398 + 64,508

3. 3,254 + 754 + 690

4. 54,678 + 7,123

5. 98,455 - 9,770

6. 14,789 - 908

7. 38,904 - 9,878

8. 908 - 774

9. 6,996 - 456

10. 12,987 - 3,499

Multiply and Divide Whole Numbers

Exercises: **Solve. Show all work.No calculators!**

1. 742×17

2. 25×13

3. 659×7

4. 407×29

5. 81×5

6. $86 \overline{)2,236}$

7. $57 \overline{)13,338}$

8. $5 \overline{)205}$

9. $7 \overline{)1,463}$

10. $16 \overline{)3,840}$

11. $11 \overline{)2,211}$

12. $9 \overline{)3,789}$

Simplifying Fractions

When you find the answer to a problem with fractions, you might need to change the fraction to an equivalent fraction in simplest form. To *simplify*, a fraction, divide both the numerator and denominator by the same greatest number possible (the GCF).

Example: $\frac{8}{14}$ can be simplified by dividing both the numerator and denominator by 2; $\frac{8 \div 2}{14 \div 2} = \frac{4}{7}$.

The fraction $\frac{4}{7}$ is the simplified answer.

Exercises: **Simplify.**

1. $\frac{9}{21}$ _____

2. $\frac{2}{10}$ _____

3. $\frac{4}{12}$ _____

4. $\frac{12}{18}$ _____

5. $\frac{4}{6}$ _____

6. $\frac{2}{8}$ _____

7. $\frac{8}{20}$ _____

8. $\frac{10}{12}$ _____

9. $\frac{45}{45}$ _____

10. $\frac{15}{18}$ _____

11. $\frac{2}{12}$ _____

12. $\frac{6}{14}$ _____

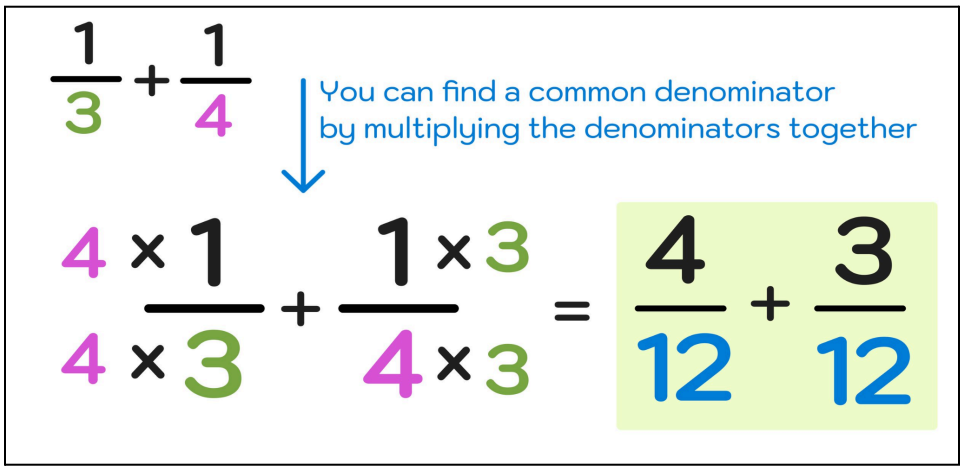
13. $\frac{3}{9}$ _____

14. $\frac{19}{57}$ _____

Fraction Operations

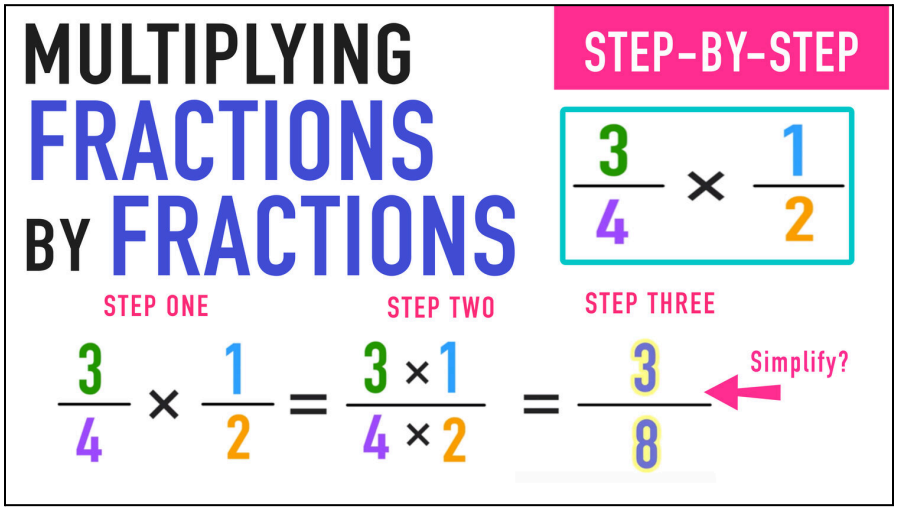
When adding and subtracting fractions, you must be sure each fraction has the same denominator. Then, add or subtract the numerators together.

Example of Adding Fractions with *Unlike* Denominators:



To multiply fractions, you multiply the numerators together and the denominators together and then, you simplify the product.

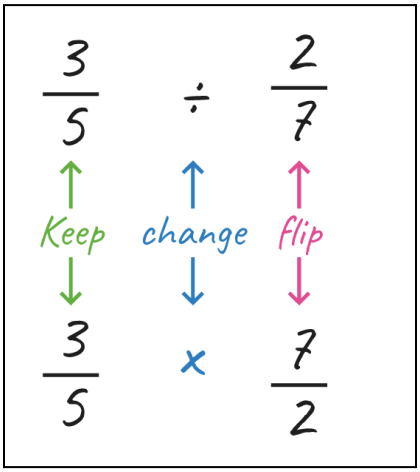
Example of Multiplying Fractions:



To divide fractions, we use the Keep-Change-Flip method. Keep the first fraction the same, change division to multiplication and then flip the second fraction (use the *reciprocal* of the

second fraction). Then, multiply the two fractions together and be sure your answer is in simplest form.

Example of Dividing Fractions:



Exercises: **Perform the indicated operations. Show all work. Simplify, if necessary.**

1. $\frac{1}{4}+\frac{3}{5}$ _____ 2. $\frac{6}{7}+\frac{2}{3}$ _____ 3. $\frac{2}{5}+\frac{8}{9}$ _____

4. $\frac{5}{6}+\frac{4}{5}$ _____ 5. $\frac{3}{4}-\frac{2}{3}$ _____ 6. $\frac{2}{5}-\frac{2}{9}$ _____

7. $\frac{9}{11}-\frac{2}{5}$ _____ 8. $\frac{5}{6}-\frac{1}{9}$ _____ 9. $\frac{1}{3}\cdot\frac{2}{3}$ _____

10. $\frac{3}{4}\cdot\frac{3}{5}$ _____ 11. $\frac{7}{8}\cdot\frac{2}{5}$ _____ 12. $\frac{6}{7}\cdot\frac{14}{15}$ _____

13. $\frac{3}{8}\div\frac{3}{4}$ _____ 14. $\frac{7}{11}\cdot\frac{3}{5}$ _____ 15. $\frac{5}{6}\div\frac{11}{12}$ _____

Add Mixed Numbers

When adding mixed numbers, add the whole numbers and the fractions separately, then simplify the answer. For example,

$1\frac{1}{3} + 4\frac{2}{5}$

$1 + 4 = 5 \rightarrow$ add the whole numbers together

$\frac{1}{3} = \frac{5}{15} \rightarrow$ rewrite $\frac{1}{3}$ with a denominator of 15

$\frac{2}{5} = \frac{6}{15} \rightarrow$ rewrite $\frac{2}{5}$ with a denominator of 15

$\frac{5}{15} + \frac{6}{15} = \frac{11}{15} \rightarrow$ find the sum of the fractions

$5 + \frac{11}{15} = 5\frac{11}{15} \rightarrow$ add the fraction and whole number together $\rightarrow 5\frac{11}{15}$ is the final answer.

First, we convert the fractions to have the same denominator. Then, add the fractions and add the whole numbers. If needed, simplify the answer.

Exercises: Solve in simplest form. Show all work. No calculators!

1. $2\frac{1}{4} + 8\frac{1}{2}$

2. $3\frac{8}{15} + 7\frac{1}{3}$

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

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

5. $7\frac{3}{7} + 6\frac{1}{2}$

6. $5\frac{5}{9} + 1\frac{1}{3}$

7. $4\frac{1}{3} + 6\frac{1}{4}$

8. $1\frac{2}{3} + 6\frac{1}{4}$

Multiply Fractions and Solve Proportions

To solve problems involving multiplying fractions and whole numbers, you must first place a one under the whole number. Then, multiply the numerators together and the denominators together. Lastly, simplify the answer.

Example:

$\frac{6}{7} \bullet 4 = \frac{6}{7} \bullet \frac{4}{1} = \frac{24}{7} = 3\frac{3}{7}$

To solve proportions, one method is to determine the multiplying factor of the two equal ratios.

For example:

$\frac{4}{9} = \frac{24}{x} \rightarrow$ 4 is multiplied by 6 to get 24, so we multiply 9 by 6 to get 54; x = 54.

$\frac{4}{9} = \frac{24}{54}$

Exercises: **Solve (for problems #8-15, solve for *n*). Show all work.**

1. $4 \bullet \frac{3}{4}$ _____ 2. $\frac{1}{5} \bullet 7$ _____ 3. $8 \bullet \frac{1}{5}$ _____

4. $6 \bullet \frac{3}{7}$ _____ 5. $\frac{4}{5} \bullet 4$ _____ 6. $\frac{2}{3} \bullet 6$ _____

7. $7 \bullet \frac{1}{4}$ _____ 8. $\frac{1}{5} = \frac{n}{20}$ _____ 9. $\frac{3}{n} = \frac{12}{28}$ _____

10. $\frac{1}{n} = \frac{5}{25}$ _____

11. $\frac{n}{4} = \frac{3}{12}$ _____

12. $\frac{3}{7} = \frac{12}{n}$ _____

13. $\frac{n}{9} = \frac{12}{27}$ _____

14. $\frac{2}{3} = \frac{18}{n}$ _____

15. $\frac{2}{7} = \frac{n}{21}$ _____

Add and Subtract Decimals

Steps:

1. Line up the decimals above each other. Add zeros so that all of the numbers have the same place value length.
2. Use the same rules as with adding and subtracting whole numbers.
3. Drop the decimal point in your answer.

Exercises: **Solve. Show all work. Use a separate sheet of paper, if necessary. No calculators.**

1. 15.7 + 2.34 + 5.06

2. 64.038 + 164.8 + 15.7

3. 2.6 + 64.89 + 4.007

4. 12.9 + 2.008 + 75.9

5. 543.8 + 27.64 + 6.9

6. 2.6 + 4.75

7. 6.45 + 54.9

8. 3.8 + 0.76 + 0.008

9. 87.4 − 56.09

10. 5.908 − 4.72

11. 68.9 − 24.74

12. 955.3 − 242.7

13. 695.42 − 44.79

14. 432.97 − 287.32

15.
$$\begin{array}{r} 78.9 \\ -\ 54.7 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 43.905 \\ -\ \ 9.08 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 200 \\ -\ \ 14.96 \\ \hline \end{array}$$

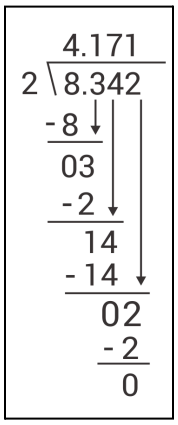
18.
$$\begin{array}{r} 15 \\ -\ \ 2.43 \\ \hline \end{array}$$

Multiply and Divide Decimals

To multiply decimals, the rules are the same as with multiplying whole numbers. Once the product is determined, the decimal point must be located. The decimal point is placed the same number of digits in from the right of the product as the number of decimal place values in the number being multiplied.

Example: To multiply 8.54×17.2, first remove the decimal points (854×172) and then, multiply. Since $854 \times 172 = 146888$, we then count the number of decimal places in the numbers being multiplied, which is 3. The final product has 3 decimal places in the answer (the decimal point is moved 3 places to the left); $8.54 \times 17.2 = 146.888$.

To divide decimals by a *whole number*, the process of division is the same but the decimal point is brought straight up from the dividend to the quotient. For example:



The decimal point moves straight up from the dividend to the quotient.

Exercises: **Solve. Show all work. Use a separate sheet of paper, if necessary.**

1. 63×0.14

2. 0.87×2.3

3. 8.94×2.1

4. 4.2×0.62

5. 34.5×4.7

6. $32.1 \times .45$

7. 91.4×47

8. 3.9×11

9. $35\overline{)70.35}$

10. $7\overline{)25.83}$

11. $14\overline{)45.584}$

12. $9\overline{)81.027}$

Unit Rates

A *rate* is a special ratio that compares quantities of two different types of items - for example, 340 miles per 10 gallons (340 mi./10 gal.). In a *unit rate*, the second quantity is always 1, such as 34 miles per gallon (34 mi./1 gal.).

Suppose you want to divide students equally between buses for a field trip. To see how many students should go on each bus, find the unit rate.

If there are 160 students and 4 buses, how many students should go on each bus?

$\frac{160}{4} = \frac{s}{1}$ → To find the number of students for one bus, divide by the number of buses total.

$\frac{160}{4} = \frac{40}{1}$ → The unit rate is $\frac{40\ students}{1\ bus}$ or 40 students per bus.

Exercises: **Solve each problem by finding the unit rate. Show all work. No calculators.**

1. John can create 20 paintings in 4 weeks. How many paintings can he create each week?

2. Sasha can walk 6 miles in 3 hours. If she has to walk 1 mile, how long will it take her?

3. Todd keeps his 4-room house very clean. It takes him 1 hour, 36 minutes to clean his whole house. How long does it take him to clean one room?

4. Victoria can make 12 bracelets in 4 days. How many bracelets can she make in one day?

5. Byron has his own bakery. He bakes 84 cakes each week. How many cakes can he make in one day?

6. 36 flowers in 3 bouquets

7. 45 points in 3 games _____

8. 72 pages in 6 chapters _____

9. 35 people at 7 tables _____

10. 48 cookies in 4 batches _____

11. 168 pens in 14 packs _____

12. $4.20 for 4 packs of crackers _____

Find the Mean of a Data Set

To find the mean (*average*) of a set of numbers, first add together all of the numbers. Then, divide by how many numbers there are in the data set.

For example, if given the following test scores: 73, 87, 94, 84, 92, and 95, add them all together first. → 73 + 87 + 94 + 84 + 92 + 95 = 525. Take the total of 525 and divide by 6, since there are 6 test scores in the data set → 525 ÷ 6 = 87.5. The mean of the test scores is 87.5.

Exercises: **Solve. Show all work.**

1. Use the following chart to solve.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	65°	68°	72°	74°	68°
2	68°	75°	80°	68°	75°
3	75°	74°	69°	79°	80°
4	80°	82°	76°	67°	79°

Find the mean (average) temperatures for:

a.) Monday: _____

b.) Tuesday: _____

c.) Wednesday: _____

d.) Thursday: _____

e.) Friday: _____

2. a.) If George has test scores of 85, 88, 92 and 87, what is his average score?

b.) Challenge: Using the same test scores for George, what would his fifth test score need to be to have an average (*mean*) grade of 90?

3. a.) If Tina's bowling scores were 120, 155, 145, 162 and 138, what was her average score?

b.) Challenge: What would Tina's score need to be in the sixth game if she wanted an average score of 145 over six games?