

**Summer Enrichment
Packet
for
Students going into
Foundations of Algebra**

Sept. 2023

This summer packet is intended to help students retain the mathematical skills and knowledge they have acquired during the school year, preventing the loss of academic progress.

While completion of this packet is not mandatory, we strongly recommend students utilize this packet. Practicing skills reinforces students' understanding of concepts that they may have struggled with during the school year, helping them to start the new year with a stronger foundation. It can also help students prepare for the challenges of the upcoming school year, and promote problem-solving skills, logical reasoning, and critical thinking abilities, which are valuable not just in math, but in many other areas of life.

You will need a TI-84⁺ calculator for this class.

Be sure to show all work where necessary and leave your answers in their most simplified form! NO CALCULATORS!

Part I - PEMDAS

P – Grouping symbols (parentheses, brackets, absolute value bars, etc.)

E – Exponents

M – Multiplication (remember this goes with division, left to right)

D – Division

A – Addition (remember this goes with subtraction, left to right)

S – Subtraction

Use the order of operations to simplify. NO CALCULATOR! Show your work.

1) $5 \cdot 3^2 - (7 + 3) \div 2$

2) $25 - (5 + 8) - 16 + 4 \div 2$

3) $16 - 2(4^2 + 3) + 4 \cdot 7$

4) $28 + 2^4 - 13 + 24 \div 4 \cdot 2$

5) $(4^2 - 2) + 16 \div 8 - (6 + 3)$

6) $52 + -6 \cdot (9 - 7) \div 2^2$

Part II – Fractions: Leave your answer as a mixed number in lowest terms where necessary. Show your work.

Adding Fractions- Remember that you must have a common denominator to add fractions. You can work the problems across (horizontally) or up and down (vertically).

$$\begin{aligned} \text{Example 1: } \frac{3}{4} + \frac{5}{6} &= \\ \frac{9}{12} + \frac{10}{12} &= \\ \frac{19}{12} &= 1\frac{7}{12} \end{aligned}$$

$$\begin{aligned} \text{Example 2: } \frac{2}{3} &= \frac{4}{6} \\ &+ \frac{1}{2} = \frac{3}{6} \\ \hline & \frac{7}{6} = 1\frac{1}{6} \end{aligned}$$

$$7) 1\frac{1}{4} + 2\frac{1}{2} =$$

$$8) 2\frac{2}{3} + 3\frac{4}{5} =$$

$$9) 4\frac{5}{6} + 5\frac{5}{9} =$$

$$10) 4\frac{3}{7} + 5\frac{11}{14} =$$

Subtracting Fractions- Remember that you must have a common denominator to subtract fractions. You can work the problems across (horizontally) or up and down (vertically).

Example 1: $\frac{3}{4} - \frac{5}{8} =$
 $\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$

Example 2: $\frac{2}{3} = \frac{10}{15}$
 $-\frac{1}{5} = \frac{3}{15}$

 $\frac{7}{15}$

11) $6\frac{7}{9} - 4\frac{1}{2} =$

12) $5\frac{2}{5} - 2\frac{7}{10} =$

13) $6 - 2\frac{8}{11} =$

14) $7\frac{3}{8} - 3\frac{2}{3} =$

Multiplying fractions: When you are multiplying fractions, you do not need to find a common denominator. You must first change any whole number or mixed number to an improper fraction. Remember, when you are multiplying fractions it is easier to simplify first, if possible, and then multiply the numerators and multiply the denominators.

EXAMPLE: $\frac{24}{25} \times \frac{15}{28} = \frac{6}{5} \times \frac{3}{7} = \frac{18}{35}$

EXAMPLE: $4\frac{2}{3} \times 15 = \frac{14}{3} \times \frac{15}{1} = 14 \times 5 = 70$

15) $\frac{3}{10} \cdot \frac{5}{6} =$

16) $2\frac{1}{4} \cdot 3\frac{1}{3} =$

17) $5\frac{5}{8} \cdot 3\frac{1}{5} =$

18) $4\frac{4}{9} \cdot 2\frac{1}{10} =$

Dividing fractions: The rule for dividing fractions and mixed numbers is to first convert each number to a fraction (proper or improper). Then keep the first number the same, change the problem to multiplication and use the reciprocal of the second fraction. Now you can follow the rules from multiplication.

EXAMPLE: $3\frac{3}{5} \div 2\frac{4}{7} = \frac{18}{5} \div \frac{18}{7} = \frac{18}{5} \times \frac{7}{18} = \frac{7}{5} = 1\frac{2}{5}$

19) $\frac{3}{8} \div \frac{3}{4} =$

20) $4\frac{1}{6} \div 2\frac{1}{2} =$

21) $3\frac{1}{4} \div 1\frac{7}{4} =$

22) $4\frac{2}{3} \div 6 =$

Part III - Word Problems: Write a number sentence that could be used to solve the situation, then solve.

23) The soccer team at MPH practices for $1\frac{3}{4}$ hours a day, 5 days a week. How many total hours do they practice each week if they don't have any games?

24) Steve can long jump $14\frac{1}{2}$ feet. His younger sister can long jump $\frac{3}{4}$ as far. How far can Steve's little sister long jump? (HINT: make sure your answer makes sense!)

25) A flight leaves the Syracuse Airport every $1\frac{1}{4}$ minutes. How many flights leave in an hour?

26) You have a $6\frac{1}{2}$ foot long piece of ribbon. You need to make bows using $\frac{3}{4}$ of a foot of ribbon for each one. How many bows can you make?