

Math 8
Fractions Unit Review
Chapter 3 (Group 3)

Name: Key

Define the following vocab words and give TWO examples:

1. Fraction:

part of a whole ex) $\frac{1}{4}$ $\frac{1}{2}$

Examples:

2. Inverse or Reciprocal:

Numerator and denominator are flipped ex) $\frac{5}{6} \rightarrow \frac{6}{5}$

Examples:

3. Improper fraction:

larger numerator than denominator ex) $\frac{15}{12}$

Examples:

4. Mixed fraction:

whole number combined with proper fraction ex) $3\frac{1}{2}$

Examples:

Part 1: Changing/Simplifying Fractions

If you have a fraction that can be written in lower terms, simplify it. If you have a fraction that is improper then write it as a mixed fraction.

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

2. $\frac{12}{4} = 3$

3. $\frac{10}{15} = \frac{2}{3}$

4. $\frac{6}{8} = \frac{3}{4}$

5. $4\frac{5}{15} = 4\frac{1}{3}$

6. $-\frac{4}{12} = -\frac{1}{3}$

7. $-\frac{20}{30} = -\frac{2}{3}$

Part 2: Adding/Subtracting Fractions

Outline the steps for adding and subtracting fractions:

- Step #1: Find a common denominator; remember to multiply the top & bottom of each fraction by the same number.
- Step #2: add the numerators, keep denominator the same.
- Step #3: Reduce.

What do you need to remember to do if the answer is an improper fraction?

Convert it to a mixed fraction.

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

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

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

$$5. -6\frac{1}{3} - 3\frac{2}{6} = -6\frac{2}{6} - 3\frac{2}{6} = -9\frac{4}{6}$$

$$3. -\frac{3}{4} + \frac{5}{6} = -\frac{9}{12} + \frac{10}{12} = \frac{1}{12} = 1\frac{7}{12}$$

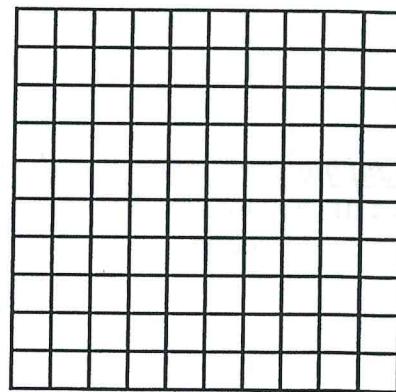
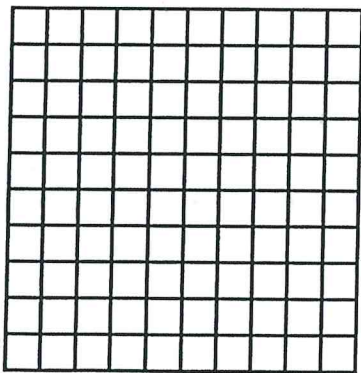
$$6. \frac{11}{12} - \frac{2}{6} = \frac{11}{12} - \frac{4}{12} = \frac{7}{12}$$

Handwritten work for problem 6:
 $-\frac{19}{3} - \frac{20}{6} = -\frac{38}{6} - \frac{20}{6} = -\frac{58}{6} = -9\frac{4}{6}$

Part 3: Multiplying Fractions

$$1. \frac{2}{3} \left(\frac{5}{6} \right) = \frac{10}{18} = \frac{5}{9}$$

$$2. \frac{7}{8} \left(\frac{2}{3} \right) = \frac{14}{24} = \frac{7}{12}$$



$$1. -\frac{4}{5} - \frac{6}{7} = -\frac{24}{35}$$

$$3. -\left(\frac{2}{7}\right)\left(\frac{4}{5}\right) = -\left(\frac{2}{7}\right)\left(\frac{4}{5}\right) = -\frac{8}{35}$$

$$2. \left(1\frac{2}{3}\right)\left(2\frac{1}{2}\right) = \left(\frac{5}{3}\right)\left(\frac{5}{2}\right) = \frac{25}{6} = 4\frac{1}{6}$$

$$4. \left(\frac{3}{6}\right)\left(\frac{7}{8}\right) = \frac{21}{48}$$

Part 4: Dividing Fractions

Write the inverse number for each below question:

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

2. $\frac{4}{53} = \frac{53}{4}$

3. $-\frac{3}{43} = -\frac{43}{3}$

4. $\frac{7}{17} = \frac{17}{7}$

5. $-\frac{8}{21} = -\frac{21}{8}$

6. $\frac{12}{29} = \frac{29}{12}$

Steps for dividing fractions:

Step #1: Convert mixed fractions to improper fraction

Step #2: flip the second fraction

Step #3: Multiply the fractions

Step #4: Reduce

Divide the following fractions. Show your work:

5. $\frac{4}{5} \div \frac{6}{7} = \frac{4}{5} \times \frac{7}{6} = \frac{14}{15}$

9. $\frac{1}{2} \div \frac{7}{8} = \frac{1}{2} \times \frac{8}{7} = \frac{4}{7}$

6. $-\frac{7}{8} \div \frac{9}{10} = -\frac{7}{8} \times \frac{10}{9} = -\frac{35}{36}$

10. $-\frac{3}{11} \div \frac{6}{11} = -\frac{3}{11} \times \frac{11}{6} = -\frac{1}{2}$

7. $-\frac{2}{7} \div \frac{4}{5} = -\frac{2}{7} \times -\frac{5}{4} = \frac{5}{14}$

11. $\frac{4}{12} \div \frac{6}{9} = \frac{4}{12} \times \frac{9}{6} = \frac{1}{2}$

8. $-\frac{6}{13} \div \frac{7}{8} = -\frac{6}{13} \times -\frac{8}{7} = \frac{48}{91}$

12. $\frac{6}{17} \div \frac{7}{13} = \frac{6}{17} \times \frac{13}{7} = \frac{78}{119}$

$$13. \frac{2}{17} \div \frac{6}{7}$$

$$\frac{2}{17} \times \frac{7}{6} = \frac{7}{51}$$

$$15. \frac{1}{3} \div \frac{3}{4}$$

$$\frac{1}{3} \times \frac{4}{3} = \frac{4}{9}$$

$$14. \frac{3}{4} \div \frac{5}{6}$$

$$\frac{3}{4} \times \frac{6}{5} = \frac{9}{10}$$

$$16. \frac{-7}{8} \div \frac{-7}{8}$$

$$\frac{-7}{8} \times \frac{8}{-7} = 1$$

Part 5: Order of Operations with Fractions

Remember: B: brackets
 E: exponents
 D: division
 M: multiplication
 A: adding
 S: subtracting

circle together the steps that happen at the same time, from left to right

$$1. \left(\frac{1}{2}\right)^2 + \frac{2}{3}\left(\frac{1}{3} + \frac{1}{3}\right) = \frac{1}{2} \times \frac{1}{2} + \frac{2}{3}\left(\frac{1}{3} + \frac{1}{3}\right)$$

$$\frac{1}{4} + \frac{2}{3}\left(\frac{2}{3}\right) = \frac{1}{4} + \frac{4}{9} = \frac{9}{36} + \frac{16}{36} = \frac{25}{36}$$

$$2. \left(\frac{1}{3}\right)^2 + \frac{1}{5}\left(\frac{2}{3} + \frac{4}{5}\right) = \frac{1}{3} \times \frac{1}{3} + \frac{1}{5}\left(\frac{10}{15} + \frac{12}{15}\right)$$

$$\frac{1}{9} + \frac{1}{5}\left(\frac{22}{15}\right) = \frac{1}{9} + \frac{22}{75} = \frac{75}{675} + \frac{198}{675} = \frac{273}{675} = \frac{91}{225}$$

$$3. \frac{1}{4}\left(\frac{4}{5} - \frac{1}{5}\right) + \frac{1}{2} = \frac{1}{4}\left(\frac{3}{5}\right) + \frac{1}{2}$$

$$\frac{3}{20} + \frac{1}{2} = \frac{3}{20} + \frac{10}{20} = \frac{13}{20}$$

$$4. \left(\frac{1}{2}\right)^3 + \frac{2}{3}\left(2\frac{1}{3} + 1\frac{1}{2}\right) = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} + \frac{2}{3}\left(2\frac{2}{6} + 1\frac{3}{6}\right)$$

$$= \frac{1}{8} + \frac{2}{3}\left(\frac{35}{6}\right) = \frac{1}{8} + \frac{2}{3} \times \frac{23}{6} = \frac{1}{8} + \frac{23}{9}$$

$$5. 2\frac{1}{3}\left(2\frac{1}{3} \div \frac{1}{3}\right) + \frac{-1}{2} =$$

$$\frac{7}{3}\left(\frac{7}{3} \times \frac{3}{1}\right) + \frac{-1}{2}$$

$$= \frac{9}{72} + \frac{184}{72} = \frac{193}{72}$$

$$\frac{7}{3} \times \frac{7}{1} + \frac{-1}{2}$$

$$\frac{49}{3} + \frac{-1}{2} = \frac{98}{6} + \frac{-3}{6} = \frac{95}{6}$$