

Fractions Handout

Adding & Subtracting Fractions

In order to add or subtract fractions, the denominators have to be the same.
When the denominators are the same, then we can add/subtract.

$$\frac{1}{2} + \frac{5}{3} \quad \frac{\text{numerator}}{\text{denominator}}$$

Step 1: Find the Lowest Common Denominator (LCD)

Find the LCD by figuring out the Least Common Multiple (LCM). For example:

$$\frac{1}{2} + \frac{5}{3} \quad 2 \cdot 3 = 6 \quad \text{Thus the LCD} = 6$$

Step 2: Multiply numerator and denominator by the number you used to make the LCD.

Here we use "3" because $3 \cdot 2 = 6$: $\left(\frac{3}{3}\right) \frac{1}{2} + \frac{5}{3} \left(\frac{2}{2}\right)$ ← Here we use "2" because $2 \cdot 3 = 6$

After we multiply everything, we end up with this: $\frac{3}{6} + \frac{10}{6}$

Step 3: Add/Subtract numerators together and keep denominators the same.

$$\left(\frac{3}{3}\right) \frac{1}{2} + \frac{5}{3} \left(\frac{2}{2}\right) = \frac{3}{6} + \frac{10}{6} = \frac{13}{6}$$

Reduce if possible; if not, you are done!

Multiplying Fractions

When multiplying fractions, multiply straight across.
Reduce if possible.

Example 1: $\frac{2}{3} \cdot \frac{4}{7} = \frac{2 \cdot 4}{3 \cdot 7} = \frac{8}{21}$

Example 2: $\frac{3}{4} \cdot \frac{2}{3} = \frac{6}{12} = \frac{6 \cdot 1}{6 \cdot 2} = \frac{1}{2}$
Both have a factor of six that cancels out.

Dividing Fractions

Flip & Multiply

$$\frac{4}{3} \div \frac{2}{5} = \frac{4}{3} \cdot \frac{5}{2} = \frac{20}{6} = \frac{10}{3} \cdot \frac{2}{2} = \frac{10}{3}$$

We flip the second fraction, then multiply straight across. Then reduce, both have a factor of 2 that cancels out.

Clearing Fractions

We can ONLY clear fractions when there is an equal sign.

Equation: $\frac{3}{2} + X = \frac{1}{4}$

Step 1: Find the LCD $\frac{3}{2} + \frac{X}{1} = \frac{1}{4}$ LCD = 4

Step 2: Multiply everything by LCD, clear the fractions, & then reduce:

$$\frac{4}{1} \cdot \left(\frac{3}{2}\right) + \left(\frac{X}{1}\right) \cdot \frac{4}{1} = \left(\frac{1}{4}\right) \cdot \frac{4}{1}$$
$$(2) 3 + 4(X) = 1$$

Simplify and Solve $6 + 4X = 1$

Subtract 6 from both sides

$$\begin{array}{r} 6 + 4X = 1 \\ -6 \quad -6 \\ \hline 4x = -5 \end{array}$$

Divide by 4 on both sides to isolate the X: $\frac{4x}{4} = \frac{-5}{4} \quad X = -\frac{5}{4}$

Add/Subtracting Fractions and Mixed Numbers

Date _____ Period _____

Evaluate each expression.

1) $\frac{7}{8} - \frac{5}{8}$

2) $\frac{1}{8} + \frac{13}{8}$

3) $\frac{5}{4} + \frac{5}{4}$

4) $\frac{7}{6} - \frac{7}{6}$

5) $\frac{3}{5} + \frac{1}{5}$

6) $\frac{11}{6} + \frac{7}{6}$

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

8) $\frac{9}{8} - \frac{3}{8}$

9) $\frac{1}{4} + \left(-\frac{11}{7}\right)$

10) $\frac{7}{4} + \left(-\frac{1}{2}\right)$

11) $\frac{1}{3} + \left(-\frac{11}{6}\right)$

12) $\frac{2}{5} - \left(-\frac{11}{7}\right)$

13) $(-4) + \frac{5}{3}$

14) $\frac{1}{5} + \left(-\frac{9}{7}\right)$

15) $\frac{8}{5} - \frac{4}{3}$

16) $\frac{4}{3} - \frac{1}{2}$

17) $4\frac{1}{2} - \frac{1}{2}$

18) $\left(-1\frac{3}{5}\right) - \left(-2\frac{3}{5}\right)$

19) $\left(-2\frac{7}{8}\right) + 4\frac{3}{8}$

20) $4\frac{2}{3} - 3\frac{2}{3}$

21) $2\frac{1}{4} - 1\frac{1}{4}$

22) $\frac{1}{6} - 1\frac{5}{6}$

23) $4\frac{7}{8} - \left(-3\frac{5}{7}\right)$

24) $4\frac{5}{7} - 3\frac{1}{2}$

25) $\frac{1}{3} - 2\frac{1}{6}$

26) $3\frac{1}{4} - 1\frac{2}{3}$

27) $\frac{1}{2} - \left(-3\frac{1}{3}\right)$

28) $1\frac{1}{5} - \left(-3\frac{3}{4}\right)$

Add/Subtracting Fractions and Mixed Numbers

Date _____ Period _____

Evaluate each expression.

1) $\frac{7}{8} - \frac{5}{8}$

$$\frac{1}{4}$$

2) $\frac{1}{8} + \frac{13}{8}$

$$\frac{7}{4}$$

3) $\frac{5}{4} + \frac{5}{4}$

$$\frac{5}{2}$$

4) $\frac{7}{6} - \frac{7}{6}$

$$0$$

5) $\frac{3}{5} + \frac{1}{5}$

$$\frac{4}{5}$$

6) $\frac{11}{6} + \frac{7}{6}$

$$3$$

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

$$\frac{5}{7}$$

8) $\frac{9}{8} - \frac{3}{8}$

$$\frac{3}{4}$$

9) $\frac{1}{4} + \left(-\frac{11}{7}\right)$

$$-\frac{37}{28}$$

10) $\frac{7}{4} + \left(-\frac{1}{2}\right)$

$$\frac{5}{4}$$

11) $\frac{1}{3} + \left(-\frac{11}{6}\right)$

$$-\frac{3}{2}$$

12) $\frac{2}{5} - \left(-\frac{11}{7}\right)$

$$\frac{69}{35}$$

13) $(-4) + \frac{5}{3}$

$$-\frac{7}{3}$$

14) $\frac{1}{5} + \left(-\frac{9}{7}\right)$

$$-\frac{38}{35}$$

$$15) \frac{8}{5} - \frac{4}{3}$$

$$\frac{4}{15}$$

$$16) \frac{4}{3} - \frac{1}{2}$$

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

$$17) 4\frac{1}{2} - \frac{1}{2}$$

$$4$$

$$18) \left(-1\frac{3}{5}\right) - \left(-2\frac{3}{5}\right)$$

$$1$$

$$19) \left(-2\frac{7}{8}\right) + 4\frac{3}{8}$$

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

$$20) 4\frac{2}{3} - 3\frac{2}{3}$$

$$1$$

$$21) 2\frac{1}{4} - 1\frac{1}{4}$$

$$1$$

$$22) \frac{1}{6} - 1\frac{5}{6}$$

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

$$23) 4\frac{7}{8} - \left(-3\frac{5}{7}\right)$$

$$8\frac{33}{56}$$

$$24) 4\frac{5}{7} - 3\frac{1}{2}$$

$$1\frac{3}{14}$$

$$25) \frac{1}{3} - 2\frac{1}{6}$$

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

$$26) 3\frac{1}{4} - 1\frac{2}{3}$$

$$1\frac{7}{12}$$

$$27) \frac{1}{2} - \left(-3\frac{1}{3}\right)$$

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

$$28) 1\frac{1}{5} - \left(-3\frac{3}{4}\right)$$

$$4\frac{19}{20}$$

Multiplying/Dividing Fractions and Mixed Numbers

Find each product.

1) $-\frac{5}{4} \cdot \frac{1}{3}$

2) $\frac{8}{7} \cdot \frac{7}{10}$

3) $\frac{4}{9} \cdot \frac{7}{4}$

4) $-\frac{2}{3} \cdot \frac{5}{4}$

5) $-2 \cdot \frac{3}{7}$

6) $-2\frac{2}{3} \cdot 4\frac{1}{10}$

7) $-2\frac{1}{5} \cdot -1\frac{3}{4}$

8) $-1\frac{1}{4} \cdot 9$

9) $-1\frac{5}{7} \cdot -2\frac{1}{2}$

10) $-2\frac{3}{8} \cdot 2\frac{1}{2}$

Find each quotient.

$$11) \frac{-1}{5} \div \frac{7}{4}$$

$$12) \frac{-1}{2} \div \frac{5}{4}$$

$$13) \frac{-3}{2} \div \frac{-10}{7}$$

$$14) \frac{1}{2} \div \frac{8}{7}$$

$$15) \frac{-9}{5} \div 2$$

$$16) -3\frac{5}{9} \div 3$$

$$17) -2 \div -3\frac{4}{5}$$

$$18) \frac{1}{9} \div -1\frac{1}{3}$$

$$19) 1\frac{6}{7} \div 5\frac{3}{4}$$

$$20) -3\frac{7}{10} \div 2\frac{1}{4}$$

Multiplying/Dividing Fractions and Mixed Numbers

Date _____ Period _____

Find each product.

1) $-\frac{5}{4} \cdot \frac{1}{3}$

$$-\frac{5}{12}$$

2) $\frac{8}{7} \cdot \frac{7}{10}$

$$\frac{4}{5}$$

3) $\frac{4}{9} \cdot \frac{7}{4}$

$$\frac{7}{9}$$

4) $-\frac{2}{3} \cdot \frac{5}{4}$

$$-\frac{5}{6}$$

5) $-2 \cdot \frac{3}{7}$

$$-\frac{6}{7}$$

6) $-2\frac{2}{3} \cdot 4\frac{1}{10}$

$$-10\frac{14}{15}$$

7) $-2\frac{1}{5} \cdot -1\frac{3}{4}$

$$3\frac{17}{20}$$

8) $-1\frac{1}{4} \cdot 9$

$$-11\frac{1}{4}$$

9) $-1\frac{5}{7} \cdot -2\frac{1}{2}$

$$4\frac{2}{7}$$

10) $-2\frac{3}{8} \cdot 2\frac{1}{2}$

$$-5\frac{15}{16}$$

Find each quotient.

$$11) \frac{-1}{5} \div \frac{7}{4}$$

$$-\frac{4}{35}$$

$$12) \frac{-1}{2} \div \frac{5}{4}$$

$$-\frac{2}{5}$$

$$13) \frac{-3}{2} \div \frac{-10}{7}$$

$$\frac{21}{20}$$

$$14) \frac{1}{2} \div \frac{8}{7}$$

$$\frac{7}{16}$$

$$15) \frac{-9}{5} \div 2$$

$$-\frac{9}{10}$$

$$16) -3\frac{5}{9} \div 3$$

$$-1\frac{5}{27}$$

$$17) -2 \div -3\frac{4}{5}$$

$$\frac{10}{19}$$

$$18) \frac{1}{9} \div -1\frac{1}{3}$$

$$-\frac{1}{12}$$

$$19) 1\frac{6}{7} \div 5\frac{3}{4}$$

$$\frac{52}{161}$$

$$20) -3\frac{7}{10} \div 2\frac{1}{4}$$

$$-1\frac{29}{45}$$