

Name _____

Algebra • Fractions and Properties of Addition

Properties of addition can help you group and order addends so you can use mental math to find sums.

The **Commutative Property of Addition** states that when the order of two addends is changed, the sum is the same.

$$6 + 3 = 3 + 6$$

The **Associative Property of Addition** states that when the grouping of addends is changed, the sum is the same.

$$(3 + 6) + 4 = 3 + (6 + 4)$$

Use the properties and mental math to add $10\frac{3}{8} + 4\frac{7}{8} + 6\frac{5}{8}$.

Step 1 Look for fractions that combine to make 1. $10\left(\frac{3}{8}\right) + 4\frac{7}{8} + 6\left(\frac{5}{8}\right)$

Step 2 Use the Commutative Property to order the addends so that the fractions with a sum of 1 are together.

$$10\frac{3}{8} + 4\frac{7}{8} + 6\frac{5}{8} = 10\frac{3}{8} + 6\frac{5}{8} + 4\frac{7}{8}$$

Step 3 Use the Associative Property to group the addends that you can add mentally.

$$= \left(10\frac{3}{8} + 6\frac{5}{8}\right) + 4\frac{7}{8}$$

Step 4 Add the grouped numbers and then add the other mixed number.

$$= (17) + 4\frac{7}{8}$$

Step 5 Write the sum.

$$= 21\frac{7}{8}$$

Use the properties and mental math to find the sum.

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

2. $\left(5\frac{7}{10} + 1\frac{4}{10}\right) + 6\frac{3}{10}$

3. $7\frac{3}{4} + \left(5 + 3\frac{1}{4}\right)$

4. $\left(2\frac{5}{12} + 3\frac{11}{12}\right) + 1\frac{7}{12}$

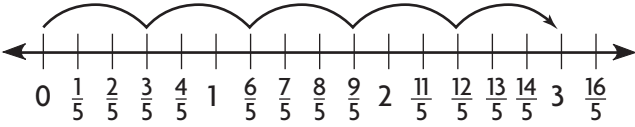
5. $4\frac{7}{8} + \left(6\frac{3}{8} + \frac{1}{8}\right)$

6. $9\frac{2}{6} + \left(4\frac{1}{6} + 7\frac{4}{6}\right)$

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Problem Solving • Multistep Fraction Problems

Jeff runs $\frac{3}{5}$ mile each day. He wants to know how many days he has to run before the total number of miles he runs is a whole number.

Read the Problem	Solve the Problem
<p>What do I need to find?</p> <p>I need to find <u>how many days Jeff needs to run $\frac{3}{5}$ mile</u> until the total number of miles he runs is a whole number.</p>	<p>Describe how to act it out. Use a number line.</p>  <p>Day 1: $\frac{3}{5}$ mile</p>
<p>What information do I need to use?</p> <p>Jeff runs $\frac{3}{5}$ mile a day. He wants the distance run to be a <u>whole number</u>.</p>	<p>Day 2: $\frac{6}{5}$ mile $\frac{3}{5} + \frac{3}{5} = \frac{6}{5}$ 1 whole mile and $\frac{1}{5}$ mile more</p> <p>Day 3: $\frac{9}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{9}{5}$ 1 whole mile and $\frac{4}{5}$ mile more</p>
<p>How will I use the information?</p> <p>I can use a number line and <u>patterns</u> to <u>act out</u> the problem.</p>	<p>Day 4: $\frac{12}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{12}{5}$ 2 whole miles and $\frac{2}{5}$ mile more</p> <p>Day 5: $\frac{15}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{15}{5}$ 3 whole miles</p> <p>So, Jeff will run <u>3</u> miles in <u>5</u> days.</p>

- Lena runs $\frac{2}{3}$ mile each day. She wants to know how many days she has to run before she has run a whole number of miles.

- Mack is repackaging $\frac{6}{8}$ -pound bags of birdseed into 1-pound bags of birdseed. What is the least number of $\frac{6}{8}$ -pound bags of birdseed he needs in order to fill 1-pound bags without leftovers?