



# Sixth Grade Math

This packet includes four sections that cover the major content of 6<sup>th</sup> grade math. Each section includes four pages of notes and practice for each topic. For additional support, visit KCS TV on YouTube for instructional videos that accompany each section.

The following content is included in this packet:

|            | Topic                      |                                   |                                 |                                      |
|------------|----------------------------|-----------------------------------|---------------------------------|--------------------------------------|
|            | <b>I. Area of Polygons</b> | <b>II. Ratio Reasoning</b>        | <b>III. Rational Numbers</b>    | <b>IV. Equations and Expressions</b> |
| Activity 1 | Area of Quadrilaterals     | Rates                             | Dividing Mixed Numbers          | Order of Operations                  |
| Activity 2 | Area of Triangles          | Ratios, Rates, Tables, and Graphs | Adding and Subtracting Decimals | Addition and Subtraction Equations   |
| Activity 3 | Solving Area Problems      | Solving Problems with Proportions | Multiply Decimals               | Evaluating Expressions               |
| Activity 4 | Area of Polygons           | Understanding Percent             | Dividing Decimals               | Generating Equivalent Expressions    |

## Section III

# Dividing Mixed Numbers

### Activity 1

Two numbers are **reciprocals** if their product is 1.

$$\frac{7}{3} \text{ and } \frac{3}{7} \text{ are reciprocals because } \frac{7}{3} \times \frac{3}{7} = 1.$$

Write a mixed number as an improper fraction to find its reciprocal.

$$2\frac{3}{4} \text{ and } \frac{4}{11} \text{ are reciprocals because } 2\frac{3}{4} = \frac{11}{4} \text{ and } \frac{11}{4} \times \frac{4}{11} = 1.$$

To find  $2\frac{3}{4} \div 1\frac{3}{4}$ , first rewrite the mixed numbers as improper fractions.

$$\frac{11}{4} \div \frac{7}{4}$$

Next, rewrite the expression as a multiplication expression and replace the divisor with its reciprocal.

$$\frac{11}{4} \times \frac{4}{7}$$

Solve. Write your answer in simplest form.

$$2\frac{3}{4} \div 1\frac{3}{4} = \frac{11}{4} \div \frac{7}{4} = \frac{11}{4} \times \frac{4}{7} = \frac{11}{7} = 1\frac{4}{7}$$

**Find the reciprocal.**

1.  $\frac{9}{14}$

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

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

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**Complete the division. Write each answer in simplest form.**

4.  $3\frac{3}{5} \div 2\frac{1}{4}$

$$= \frac{18}{5} \div \frac{\quad}{4}$$

$$= \frac{\quad}{5} \times \frac{\quad}{9}$$

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5.  $1\frac{1}{2} \div 1\frac{1}{4}$

$$= \frac{3}{2} \div \frac{\quad}{4}$$

$$= \frac{\quad}{\quad} \times \frac{\quad}{\quad}$$

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6.  $\frac{5}{12} \div 1\frac{7}{8}$

$$= \frac{\quad}{12} \div \frac{\quad}{8}$$

$$= \frac{\quad}{\quad} \times \frac{\quad}{\quad}$$

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7.  $3\frac{1}{8} \div \frac{1}{2}$

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8.  $1\frac{1}{6} \div 2\frac{2}{3}$

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9.  $2 \div 1\frac{1}{5}$

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## Section III Adding and Subtracting Decimals

### Activity 2

You can use a place-value chart to help you add and subtract decimals.

Add 1.4 and 0.9.

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| + |      | 1    | 4      |            |             |
|   |      | 0    | 9      |            |             |

So,  $1.4 + 0.9 = 2.3$ .

Subtract 2.4 from 3.1.

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| - |      | 3    | 1      |            |             |
|   |      | 2    | 4      |            |             |

So,  $3.1 - 2.4 = 0.7$ .

Find each sum or difference.

1.

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| + |      | 2    | 6      |            |             |
|   |      | 1    | 1      | 5          |             |

2.

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| - |      | 2    | 5      | 3          |             |
|   |      | 1    | 7      |            |             |

3.  $4.3 + 1.4$

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| + |      |      |        |            |             |
|   |      |      |        |            |             |

4.  $14.4 - 3.8$

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| - |      |      |        |            |             |
|   |      |      |        |            |             |

5.  $7.3 + 8.5$

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| + |      |      |        |            |             |
|   |      |      |        |            |             |

6.  $12.34 - 6.9$

|   | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|------|------|--------|------------|-------------|
| - |      |      |        |            |             |
|   |      |      |        |            |             |

Estimate the answers to Exercises 3–6 by rounding to the nearest whole number. Compare your estimate to the exact answers.

7.  $4.3 + 1.4$

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8.  $14.4 - 3.8$

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9.  $7.3 + 8.5$

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10.  $12.34 - 6.9$

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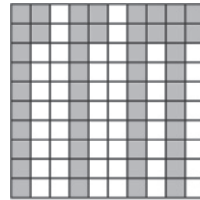
**Section III** **Multiplying Decimals**  
**Activity 3**

You can use a model to help you multiply a decimal by a whole number.

Find the product of 0.12 and 4.

Use a 10-by-10 grid. Shade 4 groups of 12 squares.

Count the number of shaded squares. Since you have shaded 48 of the 100 squares,  $0.12 \times 4 = 0.48$ .



**Find each product.**

1.  $0.23 \times 3$

2.  $0.41 \times 2$

3.  $0.01 \times 5$

4.  $0.32 \times 2$

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5.  $0.15 \times 3$

6.  $0.42 \times 2$

7.  $0.04 \times 8$

8.  $0.22 \times 4$

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You can also use a model to help you multiply a decimal by a decimal.

Find the product of 0.8 and 0.4.

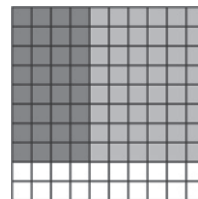
**Step 1** Shade 8 tenths of the figure.

**Step 2** Shade darker 4 tenths of the shaded area.

**Step 3** How many squares have you shaded twice?

You have twice shaded 32 of the squares.

So,  $0.8 \times 0.4 = 0.32$ .



**Find each product.**

9.  $0.2 \times 0.8$

10.  $0.7 \times 0.9$

11.  $0.5 \times 0.5$

12.  $0.3 \times 0.6$

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13.  $0.5 \times 0.2$

14.  $0.4 \times 0.4$

15.  $0.1 \times 0.9$

16.  $0.4 \times 0.7$

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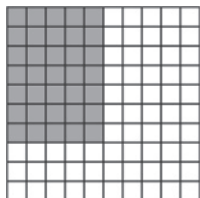
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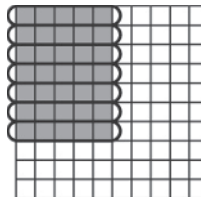
**Section III** **Dividing Decimals**  
**Activity 4**

You can use decimal grids to help you divide by whole numbers.

To divide 0.35 by 7, first shade in a decimal grid to show thirty-five hundredths.



$0.35 \div 7$  means “divide 0.35 into 7 equal groups.” Show this on the decimal grid.



The number of units in each group is the quotient.

So,  $0.35 \div 7 = 0.05$ .

**Find each quotient.**

1.  $0.6 \div 5$

2.  $0.78 \div 6$

3.  $0.32 \div 4$

4.  $0.99 \div 0.0033$

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You can use powers of 10 to help you divide a decimal by a decimal.

Divide 0.048 by 0.12.

Notice that 0.12 has two decimal places.

To make this a whole number, multiply by 100.

$$0.048 \div 0.12 \longrightarrow 0.12 \cdot 100 = 12 \quad 0.048 \cdot 100 = 4.8$$

Then divide.

$$4.8 \div 12$$

**Step 1:** Divide as you would with a whole number.

$$\begin{array}{r} 0.4 \\ 12 \overline{)4.8} \end{array}$$

**Step 2:** Think  $48 \div 12 = 4$ .

$$\begin{array}{r} 48 \\ \underline{48} \\ 0 \end{array}$$

**Step 3:** Place the decimal point in the quotient.  
Add a zero as necessary.

So,  $0.048 \div 0.12 = 0.4$ .

**Find each quotient.**

5.  $0.4 \overline{)0.08}$

6.  $0.9 \overline{)0.63}$

7.  $0.008 \overline{)0.4}$

8.  $0.04 \overline{)0.032}$

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## Answer Key

### III. Rational Numbers

#### Activity 1: Dividing Mixed Numbers

1.  $\frac{14}{9}$

2.  $\frac{2}{7}$

3.  $\frac{3}{32}$

4.  $\frac{18}{5} \div \frac{9}{4}$   
 $\frac{18}{5} \times \frac{4}{9}$   
 $\frac{72}{45} = \frac{8}{5} = 1\frac{3}{5}$

5.  $\frac{3}{2} \div \frac{5}{4}$   
 $\frac{3}{2} \times \frac{4}{5}$   
 $\frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$

6.  $\frac{5}{12} \div \frac{15}{8}$   
 $\frac{5}{12} \times \frac{8}{15}$   
 $\frac{40}{180} = \frac{2}{9}$

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

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

9.  $1\frac{2}{3}$

#### Activity 2: Adding and Subtracting Decimals

1. 3.75

2. 0.83

3. 4.3, 1.4; 5.7

4. 1.44, 3.8; 10.6

5. 7.3, 8.5; 15.8

6. 12.34, 6.9; 5.44

7. 5, 5.7; underestimate

8. 10; 10.6; underestimate

9. 16; 15.8; overestimate

10. 5; 5.44; underestimate

#### Activity 3: Multiply Decimals

1. 0.69

2. 0.82

3. 0.05

4. 0.64

5. 0.45

6. 0.84

7. 0.32

8. 0.88

9. 0.16

10. 0.63

11. 0.25

12. 0.18

13. 0.1

14. 0.16

15. 0.09

16. 0.28

#### Activity 4: Dividing Decimals

1. 0.12

2. 0.13

3. 0.08

4. 300

5. 0.2

6. 0.7

7. 50

8. 0.8