Area Models for Fraction Multiplication

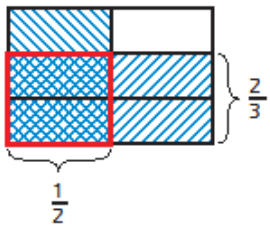
Lesson 2-4

DATE TIME

Math Message

1. The town of Andersonville turned an empty lot into a community garden with rectangular garden beds. Alicia was excited to be the first to work on the garden. She planted $\frac{2}{3}$ of $\frac{1}{2}$ of a garden bed on her first day.

   a. Describe how the diagram on the right represents the problem.



   _____

   _____

   _____

   _____

   _____

   b. Write a number sentence for the problem. _____

For Problems 2–3, draw and label area models and write number sentences to represent the problems.

2. If Alicia planted $\frac{3}{4}$ of $\frac{3}{5}$ of a garden bed, what fraction of the bed did she plant? _____

   Number sentence: _____

3. Anton planted kale and celery as companion plants. He bought packages with an equal number of seeds. He used $\frac{1}{3}$ of a package of kale seeds. He needed 6 times as many celery seeds. How many packages of celery seed did he buy? _____

   Number sentence: _____

4. Explain how the area models in Problems 2 and 3 are different.

   _____

   _____

   _____

   _____

Multiplying Mixed Numbers

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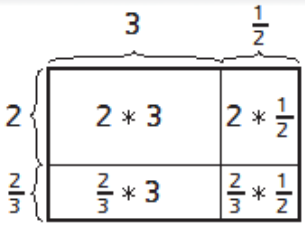
1 The community garden is divided into same-size beds. Kim and Eric have $2\frac{2}{3}$ garden beds of broccoli mixed with rosemary. They need $3\frac{1}{2}$ times this garden-bed space to add squash. Kim estimated that they need 9 beds and used the diagram at the right to figure out exactly how many beds they need.



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

a. Explain what Kim did. _____

$3\overline{)28}$ $9\frac{1}{3}$, -27, 1

$\frac{8}{3} \cdot \frac{7}{8} = \frac{28}{3} = 9\frac{1}{3}$

$9\frac{1}{3}$ beds

① Make Improper fractions.
② Cancel and multiply
③ Make a mixed number
④ Reduce

First estimate, and then use partial-products diagrams to solve Problems 2–3.

2 Last year Issa planted $5\frac{2}{3}$ trays of cauliflower seeds, but many of the cauliflower seeds did not grow. So this year, she decides to plant $4\frac{1}{4}$ times as many trays as last year.

How many trays of cauliflower seeds will Issa plant? Estimate: 24 trays

$5\frac{2}{3} \cdot 4\frac{1}{4}$

$\frac{17}{3} \cdot \frac{17}{4} = \frac{289}{12}$

$24\frac{1}{12}$ trays

$12\overline{)289}$ $024\frac{1}{12}$, -24, 49, -48, 1 $\quad 24\frac{1}{12}$

Divide
Multiply
Subtract
Check
Bring down

Number sentence: _____

Solution: _____

3 $6\frac{1}{2} * 4\frac{5}{6} = ?$

Number sentence for estimate: _____

Answer: _____

Plotting Points

Lesson 2-4

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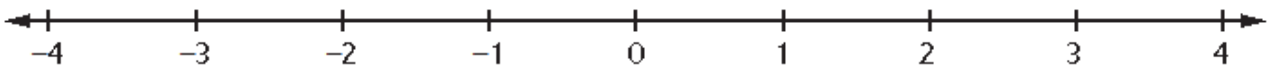
SRB 94-96, 189-170

1 Place each of the following points on the number line. Label the points.

I: -2 *A*: $2\frac{3}{4}$ *E*: $\frac{4}{5}$

L: $-3\frac{1}{2}$ *R*: 4 *N*: $-1\frac{1}{3}$



2 **a.** Circle the points you plotted in Problem 1 that are plotted on integers.

b. Which numbers in Problem 1 are rational numbers? _____

3 List two numbers between each pair of numbers.

a. $3\frac{1}{2}$ and 4 _____ and _____

b. 0 and $\frac{1}{4}$ _____ and _____

c. $2\frac{1}{10}$ and $2\frac{2}{10}$ _____ and _____

4 Plot the points on the coordinate grid.

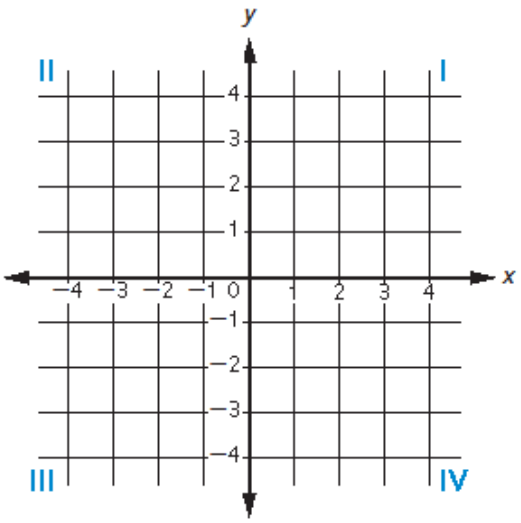
S: (1, 3)

H: (2, 0)

A: (−2, 1)

P: $(-3\frac{1}{2}, -3\frac{1}{2})$

E: $(0, -1\frac{1}{2})$



5 Find the point whose *x*- and *y*-coordinates are opposite the *x*- and *y*-coordinates for point *S*.

Write the coordinates. _____

6 If you graph your point from Problem 5, in which quadrant would it be? _____

7 **a.** In which quadrant did you not plot any points? _____

b. Give the coordinates of a point in this quadrant. _____

Math Boxes

Lesson 2-4

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Math Boxes

1 Compute.

a. $6\frac{1}{3} - 4\frac{2}{3} =$ _____

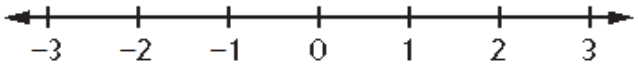
b. _____ $= 7 - 2\frac{3}{4}$

c. $2\frac{1}{5} -$ _____ $= 1\frac{3}{5}$

Spiral

SRB 180-183

2 Mark and label each point on the number line.



A: 1

B: $2\frac{1}{4}$

C: $-\frac{3}{4}$

D: $-1\frac{1}{2}$

SRB 94

3 Riley has 8 bracelets. He wants to give half of them away.

Write a number sentence to show how you solved the problem.

Number sentence: _____

SRB 32

4 Rename each fraction as a mixed number.

a. _____ $= \frac{22}{3}$

b. $\frac{17}{5} =$ _____

c. $\frac{18}{4} =$ _____

d. $\frac{66}{8} =$ _____

SRB 161

5 Which questions are statistical? Check all that apply.

- ☐ How many points did the team score in their last game?
- ☐ How many salads were sold in the school cafeteria last Tuesday?
- ☐ What is the typical age of a U.S. president at inauguration?
- ☐ How many hours of TV do students at this school usually watch?

SRB 200

6 Evaluate.

a. $87 + (15 \div 3) =$ _____

b. _____ $= (15 - 11) * 26$

c. $20 - 6 + (194 - 64) =$ _____

Spiral

SRB 203