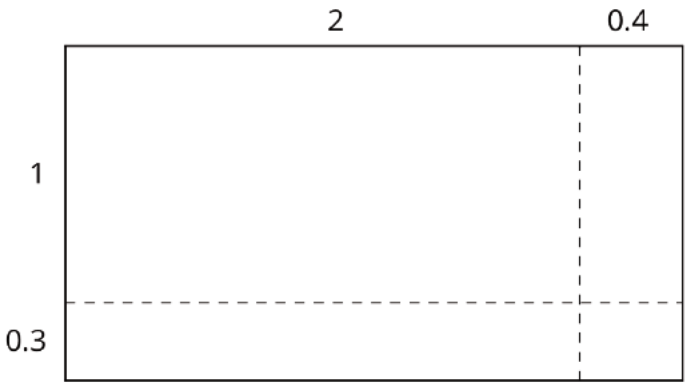
Bad Word: "FOIL" Activity

How do the area diagrams in these tasks support student learning?

6th grade – Source Illustrative Mathematics

Student Task Statement

1. You can use area diagrams to represent products of decimals. Here is an area diagram that represents $(2.4) \cdot (1.3)$.



a. Find the region that represents $(0.4) \cdot (0.3)$. Label it with its area of 0.12.

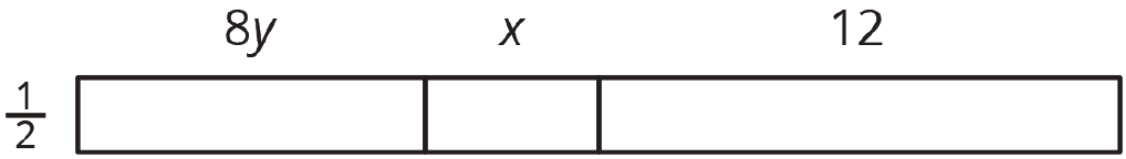
b. Label the other regions with their areas.

c. Find the value of $(2.4) \cdot (1.3)$. Show your reasoning.

7th grade – Source: Illustrative Mathematics

Student Task Statement

1. Write two expressions for the area of the big rectangle.

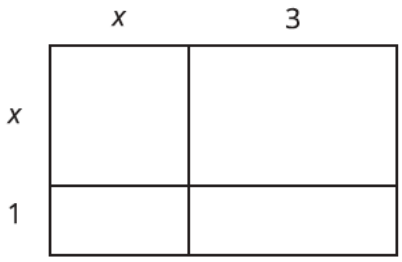


2. Use the distributive property to write an expression that is equivalent to $\frac{1}{2}(8y + -x + -12)$. The boxes can help you organize your work.

Algebra 1 - Source: Illustrative Mathematics

Student Task Statement

1. Here is a diagram of a rectangle with side lengths $x + 1$ and $x + 3$. Use this diagram to show that $(x + 1)(x + 3)$ and $x^2 + 4x + 3$ are equivalent expressions.



2. Draw diagrams to help you write an equivalent expression for each of the following:
   a. $(x + 5)^2$
   b. $2x(x + 4)$
   c. $(2x + 1)(x + 3)$
   d. $(x + m)(x + n)$
3. Write an equivalent expression for each expression without drawing a diagram:
   a. $(x + 2)(x + 6)$
   b. $(x + 5)(2x + 10)$

Algebra 2 - Source: Illustrative Mathematics

1. Diego used the long division shown here to figure out that $6x^2 - 7x - 5 = (2x + 1)(3x - 5)$. Show what it would look like if he had used a diagram.

$$
\begin{array}{r}
3x - 5 \\
2x + 1 \overline{)\,6x^2 - 7x - 5} \\
\underline{-6x^2 - 3x} \\
-10x - 5 \\
\underline{10x + 5} \\
0
\end{array}
$$

$2x$	$6x^2$	
1		

Pause here for a whole-class discussion.

2. $(x - 2)$ is a factor of $2x^3 - 7x^2 + x + 10$, which means there is some other factor A where $2x^3 - 7x^2 + x + 10 = (x - 2)(A)$. Finish the division started here to find the value of A.

$$
\begin{array}{r}
2x^2 \\
x - 2 \overline{)\,2x^3 - 7x^2 + x + 10} \\
\underline{-2x^3 + 4x^2}
\end{array}
$$

3. Jada used the diagram shown here to figure out that $2x^3 + 13x^2 + 16x + 5 = (2x + 1)(x^2 + 6x + 5)$. Show what it would look like if she had used long division.

	x^2	$6x$	5
$2x$	$2x^3$	$12x^2$	$10x$
1	x^2	$6x$	5

$$2x + 1 \overline{)\,2x^3 + 13x^2 + 16x + 5}$$

Bad Word “Cancel” Activity

Complete the mathematical work, then name the operation used to rewrite the expression

Simplify $\frac{8y^2(y-2)}{2y(y+1)(y-2)}$	
Solve $2x+y=15$ $3x-y=5$	
Solve $\sqrt{x+2}=5$	
Solve $2x+6=18$	
Solve $\frac{x}{3}=6$	
Simplify $4x^2+6x-6x+24$	
Simplify $\frac{8x}{12x^3y}$	
Solve $\sin x=\frac{\pi}{2}$	

Bad word “Cross Multiply” Activity

Task A: **Proportions as equivalent Fractions**

Find x, by thinking of finding equivalent fractions.

$$\frac{x}{7} = \frac{15}{21}$$

Task B: **Proportions as solving equations**

Find x by solving the equation by using inverse operations.

$$\frac{x}{7} = \frac{15}{21}$$

Bad Phrase “Move the Decimal” Activity

Task 1: Rewrite 3.45×10^{-4} in standard form.

If I’m _____ (multiplying/dividing) by a power of ten, then digits move to the _____ (right/left) _____places because their place value has _____ (increased/decreased) by a factor of _____.

Task 2: Rewrite 0.000456 in scientific notation.

- Question 1 – How much did the place value change by?
- Question 2 – Does the *a* value need to be bigger or smaller in standard form?