Lesson 14: Writing Division Expressions

Student Outcomes

- Students write numerical expressions in two forms, dividend ÷ divisor and $\frac{\text{dividend}}{\text{divisor}}$, and note the relationship between the two.

Lesson Notes

This is the second day of a two-day lesson.

Classwork

Fluency Exercise (5 Minutes): Long Division Algorithm

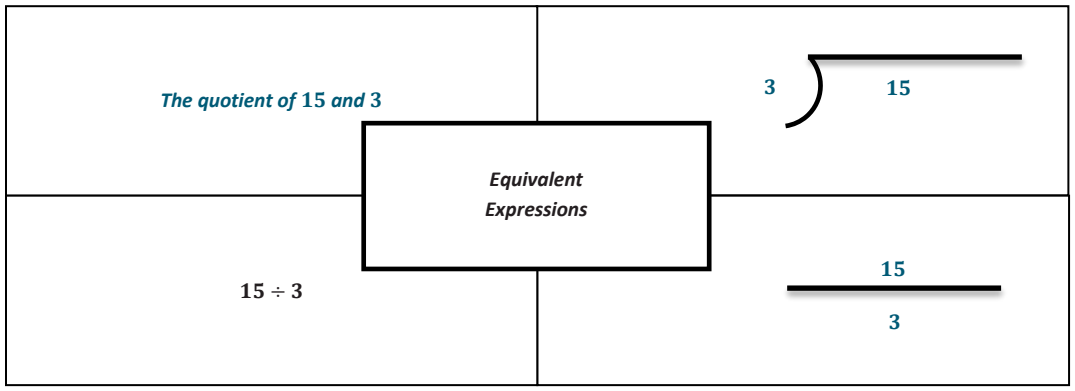
RWBE: Refer to the Rapid White Board Exchanges sections in the Module Overview for directions on how to administer a RWBE.

Example 1 (5 minutes)

MP.2

Example 1

Fill in the three remaining squares so that all the squares contain equivalent expressions.



Example 2 (5 minutes)

Example 2

Fill in a blank copy of the four boxes using the words *dividend* and *divisor* so that it is set up for any example.

MP.2

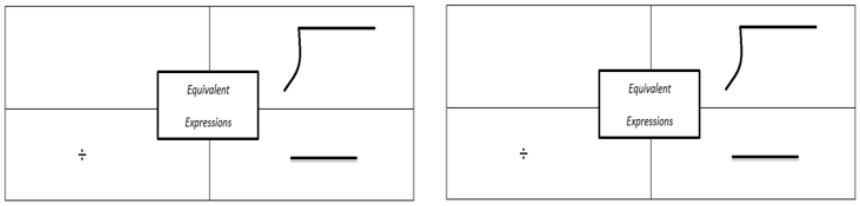
The quotient of the dividend and the divisor	*divisor* $\overline{)}$ *dividend*
Equivalent Expressions	
dividend ÷ divisor	$\frac{\text{dividend}}{\text{divisor}}$

Exercises (20 minutes)

Students will work in pairs. Each pair will be given a set of expressions to work on. There are several different versions that can be printed and used so that a variety of questions can be used throughout the classroom. The students will fill in the four rectangles, one with the given information and three with equivalent expressions.

Exercises

Complete the missing spaces in each rectangle set.



Scaffolding:

The sets of eight questions used in the Exercises can be tailored to fit the level at which students are working. You may write a set for lower-level learners and/or a set for advanced learners as needed.

Set A	*Answers*
1. $5 \div p$	*5 divided by p,* $\frac{5}{p}$, $p\overline{)5}$
2. The quotient of g and h	$g \div h$, $\frac{g}{h}$, $h\overline{)g}$
3. $w\overline{)23}$	*23 divided by w,* $23 \div w$, $\frac{23}{w}$
4. $\frac{y}{x+8}$	*y divided by the sum of x and 8,* $y \div (x+8)$, $x+8\overline{)y}$
5. 7 divided by the quantity a minus 6	$7 \div (a-6)$, $\frac{7}{a-6}$, $a-6\overline{)7}$
6. $3\overline{)m+11}$	*The sum of m and 11 divided by 3,* $(m+11) \div 3$, $\frac{m+11}{3}$
7. $(f+2) \div g$	*The sum of f and 2 divided by g,* $\frac{f+2}{g}$, $g\overline{)f+2}$

8.	$\frac{c-9}{d+3}$	*The quotient of c minus 9 and d plus 3,* $(c-9) \div (d+3)$, $d+3\overline{)c-9}$

Set B

		Answers:
1.	$h \div 11$	*The quotient of h and 11,* $11\overline{)h}$, $\frac{h}{11}$
2.	The quotient of m and n	$m \div n$, $n\overline{)m}$, $\frac{m}{n}$
3.	$5\overline{)j}$	*The quotient of j and 5,* $j \div 5$, $\frac{j}{5}$
4.	$\frac{h}{m-4}$	*h divided by the quantity m minus 4,* $h \div (m-4)$, $m-4\overline{)h}$
5.	f divided by the quantity g minus 11	$f \div (g-11)$, $g-11\overline{)f}$, $\frac{f}{g-11}$
6.	$18\overline{)a+5}$	*The sum of a and 5 divided by 18,* $(a+5) \div 18$, $\frac{a+5}{18}$
7.	$(y-3) \div x$	*The quantity y minus 3 divided by x,* $x\overline{)y-3}$, $\frac{y-3}{x}$
8.	$\frac{g+5}{h-11}$	*The quantity g plus 5 divided by the quantity h minus 11,* $(g+5) \div (h-11)$, $h-11\overline{)g+5}$

Set C

		Answers:
1.	$6 \div k$	*6 divided by k,* $k\overline{)6}$, $\frac{6}{k}$
2.	The quotient of j and k	$j \div k$, $k\overline{)j}$, $\frac{j}{k}$
3.	$10\overline{)a}$	*a divided by 10,* $a \div 10$, $\frac{a}{10}$
4.	$\frac{15}{f-2}$	*15 divided by the quantity f minus 2,* $15 \div (f-2)$, $f-2\overline{)15}$
5.	13 divided by the sum of h and 1	$13 \div (h+1)$, $h+1\overline{)13}$, $\frac{13}{h+1}$
6.	$3\overline{)c+18}$	*The sum of c plus 18 divided by 3,* $(c+18) \div 3$, $\frac{c+18}{3}$
7.	$(h-2) \div m$	*The quantity h minus 2 divided by m,* $m\overline{)h-2}$, $\frac{h-2}{m}$
8.	$\frac{4-m}{n+11}$	*The quantity 4 minus m divided by the sum of n and 11,* $(4-m) \div (n+11)$, $n+11\overline{)4-m}$

Closing (7 minutes)

Two pairs of students trade pages to check each other's work. If all of the boxes are correct, students write a sentence that summarizes why the expressions are equivalent. If there are mistakes, students write sentences to explain how to correct it.

Students evaluate some of the expressions. Many answers will need to be written as fractions or decimals.

Set A: $p = 3, w = 5, a = 10$
Set B: $h = 4, j = 8, a = 10$
Set C: $k = 2, a = 10, c = 6$

Exit Ticket (3 minutes)

Name _____ Date _____

Lesson 14: Writing Division Expressions

Exit Ticket

1. Write the division expression in words and as a fraction.

$$(g + 12) \div h$$

2. Write the following division expression using the division symbol and as a fraction: f divided by the quantity h minus 3.

Exit Ticket Sample Solutions

1. **Write the division expression in words and as a fraction.**

$$(g + 12) \div h$$

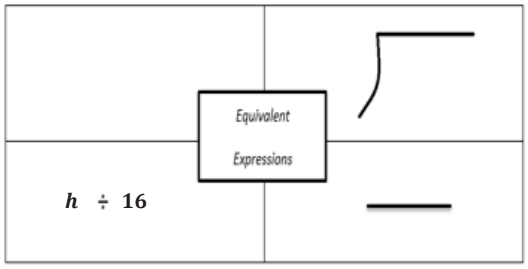
The sum of g and 12 divided by h, $\frac{g+12}{h}$.

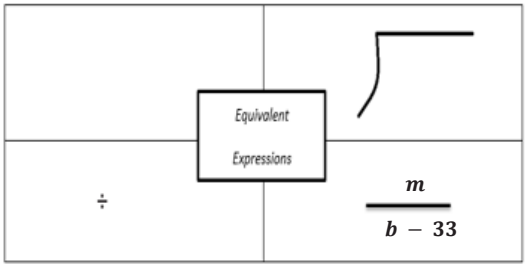
2. **Write the following division expression using the division symbol and as a fraction: f divided by the quantity h minus 3.**

$f \div (h - 3)$ and $\frac{f}{h-3}$

Problem Set Sample Solutions

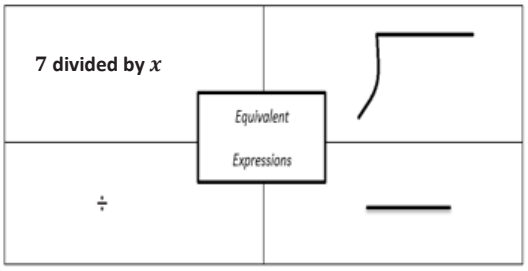
Complete the missing spaces in each rectangle set.

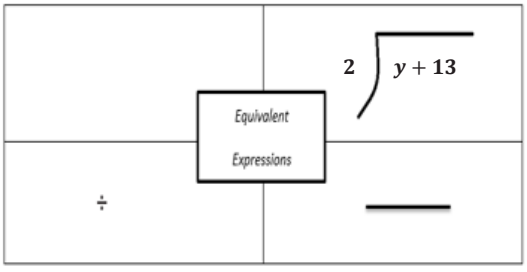




The quotient of h and 16, $16\overline{)h}$, $\frac{h}{16}$

m divided by the quantity b minus 33, $b-33\overline{)m}$, $m \div (b - 33)$





$x\overline{)7}$, $7 \div x$, $\frac{7}{x}$

The sum of y and 13 divided by 2, $(y + 13) \div 2$, $\frac{y+13}{2}$

Exercise Handout

Set A

1. $5 \div p$
2. The quotient of g and h
3. $w\overline{)23}$
4. $\frac{y}{x+8}$
5. 7 divided by the quantity a minus 6
6. $3\overline{)m+11}$
7. $(f + 2) \div g$
8. $\frac{c-9}{d+3}$

Set B

1. $h \div 11$
2. The quotient of m and n
3. $5\overline{)j}$
4. $\frac{h}{m-4}$
5. f divided by the quantity g minus 11
6. $18\overline{)a+5}$
7. $(y - 3) \div x$
8. $\frac{g+5}{h-11}$

Set C

1. $6 \div k$
2. The quotient of j and k
3. $10\overline{)a}$
4. $\frac{15}{f-2}$
5. 13 divided by the sum of h and 1
6. $3\overline{)c+18}$
7. $(h - 2) \div m$
8. $\frac{4-m}{n+11}$

Long Division Algorithm

Progression of Exercises

1. $3{,}282 \div 6$

   547

2. $2{,}712 \div 3$

   904

3. $15{,}036 \div 7$

   2,148

4. $1{,}788 \div 8$

   223.5

5. $5{,}736 \div 12$

   478

6. $35{,}472 \div 16$

   2,217

7. $13{,}384 \div 28$

   478

8. $31{,}317 \div 39$

   803

9. $1{,}113 \div 42$

   26.5

10. $4{,}082 \div 52$

    78.5