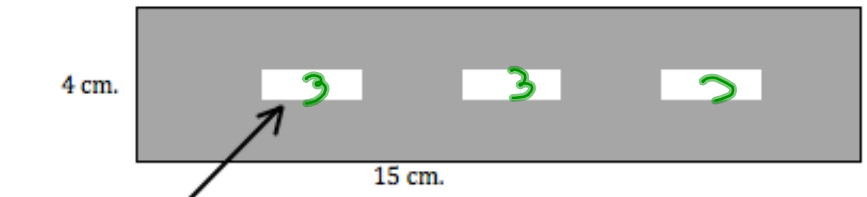
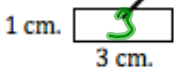
Algebra 2-2: Special Numbers in Multiplication

Warm-Up

1. Find the area of the shaded region. $51\ cm^2$





All small rectangles are the same as this one.

Area of all small: $9cm^2$

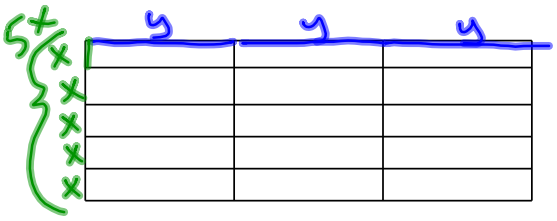
Area of Big □: $4 \times 15 = 60cm^2$

$$\begin{array}{r} 60cm^2 \\ -\ 9cm^2 \\ \hline 51cm^2 \end{array}$$

2. Each small rectangle has length y and width x.

   a. Express the area of the large rectangle as length times width. $3y \cdot 5x$

   b. Simplify your answer to part a. $15xy$



Property	Definition	Example
Multiplicative Identity Property	any # times 1 = itself	$7 \cdot 1 = 7$ $5 \cdot 1 = 5$
Multiplication Property of 0	any # times 0 = 0	$8 \cdot 0 = 0$ $5 \cdot 0 = 0$
Reciprocal of a Fraction Property	Flip top & bottom $* \frac{3}{5} \cdot \frac{5}{3} = \frac{15}{15} = 1$ $\frac{1}{6} \cdot \frac{6}{1} = \frac{6}{6} = 1$ # times its reciprocal = 1	$\frac{3}{5} \to \frac{5}{3}$ $\frac{1}{6} \to 6$ $5 \to \frac{1}{5}$

Example Problems

Give the Reciprocal of each number.

$1 \tfrac{+3}{\times 5} = \tfrac{8}{5}$

1. $\frac{3}{4}$ $\frac{4}{3}$
2. 9 $\frac{1}{9}$
3. $\frac{1}{8}$ $\frac{8}{1}$
4. $1\frac{3}{5}$ $\frac{5}{8}$
5. $\frac{-2}{7}$ $\frac{7}{-2}$
6. $\frac{-4}{x}$ $\frac{-x}{-4}$ or $\frac{x}{-4}$

Are the numbers below reciprocals? **Show why or why not.**

7. 5 & .2 — Yes $\frac{2}{10}=\frac{1}{5}$ $\frac{5}{1}\cdot\frac{1}{5}=\frac{5}{5}=1$
8. .5 & 5 — No $(.5)(5)=2.5$ Needs to be 1
9. $\frac{-1}{3}$ & 3 $\frac{-1}{3}\cdot\frac{3}{1}=\frac{-3}{3}=-1$ No ~~x~~ Needs to +1.
10. -1 & 1 $-1\cdot 1=-1$ (No)
11. .4 & -4 $(.4)(-4)=-1.6$ (No)

Give me a set of reciprocals.

$1\cdot 1=1$

$\frac{5}{1}\cdot\frac{1}{5}=\frac{5}{5}=1$

$\frac{5}{3}\cdot\frac{3}{5}=\frac{15}{15}=1$

1. 1 and 0
2. 1
3. 1
4. Multiplicative Inverse = Reciprocal
5. $\frac{0}{1} \rightarrow \frac{1}{0}$ = error = undefined, you can never divide by 0!
6. $10 \rightarrow \frac{1}{10}$ Check $\frac{10}{1}\cdot\frac{1}{10}=\frac{10}{10}=1$
7. $\frac{1}{9} \rightarrow \frac{9}{1}$ $\frac{1}{9}\cdot\frac{9}{1}=\frac{9}{9}=1$