

Day 42/43 Warm-Up: Multiply and Divide the following

1)  $\frac{5}{4} \cdot \frac{1}{3}$   
 $\frac{5}{12}$   
 mult.  
 across

2)  $\frac{8}{7} \cdot \frac{7}{10} = \frac{4}{5}$   
 $\frac{56}{70} = \frac{4}{5}$

3)  $\frac{4}{9} \cdot \frac{7}{4}$

$\frac{7}{9}$

divide flip, then mult.

4)  $\frac{1}{2} \div \frac{8}{7}$

$\frac{7}{16}$

5)  $\frac{-9}{5} \div 2$

$\frac{-9}{10}$

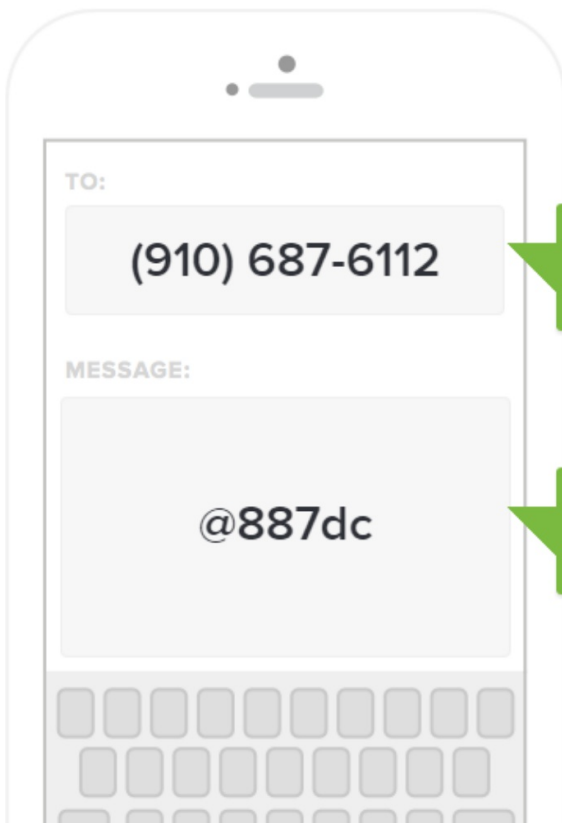
$\frac{-9}{5} \cdot \frac{1}{2} = \frac{-9}{10}$

6)  $3\frac{5}{9} \div 3$

$1 \frac{-15}{9}$

$\frac{-22}{27}$

$27 \times 5$   
 $\frac{-32}{9}$   
 $\frac{-32}{27}$



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**Example 1:** Simplify the following.

a)  $\frac{(x+1)(x-5)}{(x-5)(x^2-1)}$   $\frac{1}{x-1}$

b)  $\frac{x^2+x-12}{x^2+7x+12}$   $\frac{x-3}{x+3}$

① Factor numerator & denominator completely

② cancel like terms

③ tada!

**You Try!** Simplify the following.

a)  $\frac{x^2+6x+9}{x^2-9}$   $\frac{(x+3)(x+3)}{(x+3)(x-3)} = \frac{x+3}{x-3}$

b)  $\frac{4x^2+8x}{x^2+6x+8}$   $\frac{4x(x+2)}{(x+4)(x+2)} = \frac{4x}{x+4}$

Let's Practice Together!!

**Example 2:** Simplify completely.

$\frac{x^2+2x-8}{x^2+4x+3} \cdot \frac{3x+3}{x-2}$

① Factor everything

② mult / combine fractions

③ cancel

$\frac{(x+4)(x-2)}{(x+3)(x+1)} \cdot \frac{3(x+1)}{(x-2)}$

$\frac{3(x+1)(x+4)(x-2)}{(x+3)(x+1)(x-2)}$

$= \frac{3(x+4)}{(x+3)}$

**Example 3:** Simplify Completely.

$\frac{x^2-9}{x^2+5x+6} \cdot \frac{x+2}{3x-9}$

$\frac{(x+3)(x-3)}{(x+3)(x+2)} \cdot \frac{(x+2)}{3(x-3)}$

$= \frac{1}{3}$

**You Try!** Multiply the following.

a)  $\frac{t^2+19t+84}{4t-4} \cdot \frac{2t-2}{t^2+9t+14}$

$\frac{(t+12)(t+7)}{4(t-1)} \cdot \frac{2(t-1)}{(t+7)(t+2)}$

$= \frac{1 \cdot 2(t+12)}{2 \cdot 4(t+2)} = \frac{(t+12)}{2(t+2)}$

b)  $\frac{x^2+x-6}{x-5} \cdot \frac{x^2-25}{x^2+4x+3}$

Example 1: Simplify completely.

$$\frac{a+2}{a+3} \div \frac{a^2+a-12}{a^2-9}$$

① Flip & mult

② Factor

$$\frac{(a+2)}{(a+3)} \cdot \frac{(a+3)(a-3)}{a^2-a}$$

$$\frac{(a+2)}{(a+3)} \cdot \frac{(a+3)(a-3)}{(a+4)(a-3)}$$

$$\frac{a+2}{a+4}$$

Example 2: Simplify Completely

$$\left(\frac{r^2}{25s^2-r^2}\right) \div \left(\frac{r}{5s-r}\right) = \frac{r^2}{25s^2-r^2} \cdot \frac{(5s-r)}{r}$$

divide

$x \geq 9$   
 $(x+3)(x-3)$

$$\frac{r}{5s+r}$$

You Try! Divide the following.

a)  $\frac{-12b+18}{b^2-25} \div \frac{4b-6}{b^2-3b-10}$

b)  $\frac{3x+12}{2x+4} \div \frac{x^2-16}{x+2}$

Let's Practice Together!!