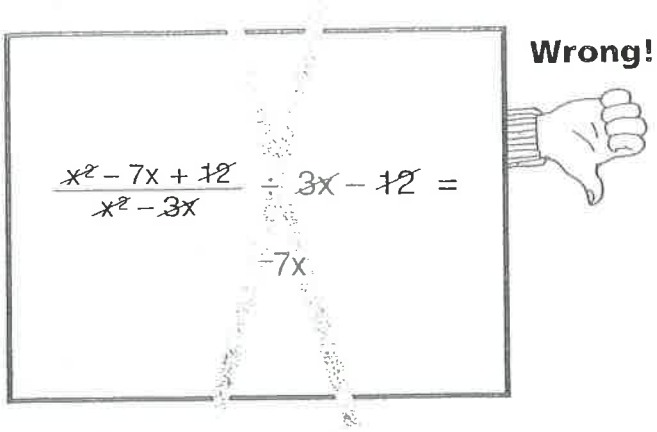
Notes 8.4 HA2

Name _____

Multiplying & Dividing Rational Expressions



$$\frac{x^2 - 7x + 12}{x^2 - 3x} \div 3x - 12 =$$

$$\frac{x^2 - 7x + 12}{x^2 - 3x} \cdot \frac{1}{3x - 12} =$$

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

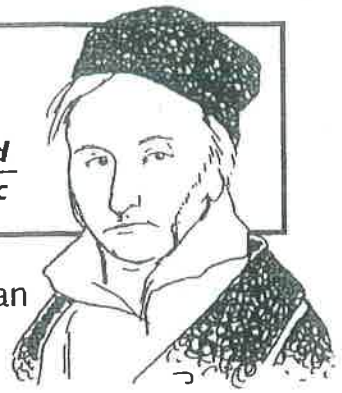
$$\frac{(x-3)(x-4)}{x(x-3)\,3\,(x-4)} = \frac{1}{3x}$$

Quick Review

1. To multiply, factor all polynomials. Then cancel out factors that are alike.
2. To divide, invert the divisor and multiply.

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$



Simplify each expression. Use the code to learn the name of the German mathematician who developed the fundamental theorem of algebra.

L **1.** $\frac{x}{x-4} \div \frac{x+6}{x-4} =$

$\frac{x}{x-4} \cdot \frac{x-4}{x+6} = \frac{x}{x+6}$

H **7.** $\frac{x^2 - 3x}{x^2 - 8x + 15} \cdot \frac{(x-5)^2}{2x} =$

$\frac{x(x-3)}{(x-5)(x-3)} \cdot \frac{(x-5)^2}{2x} = \frac{x-5}{2}$

I **2.** $\frac{2x-2}{x^2-1} \cdot x + 1 =$

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

G **8.** $\frac{9x^2}{4} \cdot \frac{8x+8}{18x} =$

$\frac{9x^2}{4} \cdot \frac{8(x+1)}{18x} = \frac{x(x+1)}{} = x^2 + x$

D **3.** $\frac{2x}{x+5} \div \frac{x-9}{x+5} =$

$\frac{2x}{x+5} \cdot \frac{x+5}{x-9} = \frac{2x}{x-9}$

R **9.** $\frac{x^2-5x+6}{x+2} \div \frac{x-3}{x^2-4} =$

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

4. $\frac{2x-5}{-3} \cdot \frac{24}{4x-10} =$

S $\frac{2x-5}{-3} \cdot \frac{24}{2(2x-5)} = \frac{24}{-6} = -4$

U **10.** $\frac{4x}{x^2-25} \cdot \frac{x-5}{8x^2+20x} =$

$\frac{4x}{(x+5)(x-5)} \cdot \frac{x-5}{4x(2x+5)} = \frac{1}{(x+5)(2x+5)}$

5. $\frac{x^2-16}{3x^2} \div x-4 =$

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

11. $\frac{x^2-9}{5} \div \frac{x+3}{10} =$

C $\frac{(x+3)(x-3)}{5} \cdot \frac{10^2}{x+3} = 2(x-3)$

6. $\frac{x+2}{x} \cdot \frac{x^2}{x^2-4} =$

A $\frac{x+2}{x} \cdot \frac{x^x}{(x+2)(x-2)} = \frac{x}{x-2}$

E **12.** $\frac{6x+12}{5x} \div \frac{x+2}{10x} =$

$\frac{6(x+2)}{5x} \cdot \frac{10x^2}{x+2} = 12$

A	C	D	E	F	G	H	I	L	R	S	U
$\frac{x}{x-2}$	$2x-6$	$\frac{2x}{x-9}$	12	$\frac{x+4}{3x^2}$	x^2+x	$\frac{x-5}{2}$	2	$\frac{x}{x+6}$	x^2-4x+4	-4	$\frac{1}{2x^2+15x+25}$

C A R L F R I E D R I C H G A U S S

11 6 9 1 5 9 2 12 3 9 2 11 7 8 6 10 4 4