AC METHOD

$15x^2 - 91x + 6$

$AC = 15 \cdot 6 = +90$

$15x^2 - 90x - x + 6$

$15x(x-6) - 1(x-6)$

$*\ (x-6)(15x-1)$

+		
90	1	= 91
45	2	= 47
30	3	= 33
18	5	= 23
15	6	= 21
10	~~9~~	. 19

OCTOBER 3, 2012 6.1 RATIONAL EXPRESSIONS

What is a rational expression?

ANS. Has a variable term in the denominator.

ex. $\frac{3}{x-4}$ $\frac{5}{x^2+2}$ $\frac{7}{(x-8)(x+12)}$

DOMAIN of rational expression - x values

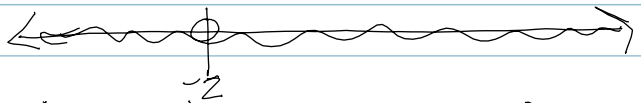
$f(x) = \frac{3}{x+2}$ $\Longrightarrow$ Cannot divide by zero

$x + 2 \neq 0$

$x \neq -2$

D: $\mathbb{R}$ except -2

$\{x \mid x \in \mathbb{R}, x \neq -2\}$



$(-\infty, -2) \cup (-2, \infty)$

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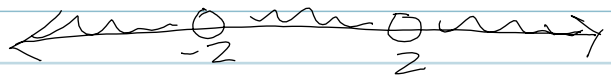
ex. 1

$$f(x) = \frac{5}{x^2-4} = \frac{5}{(x-2)(x+2)}$$

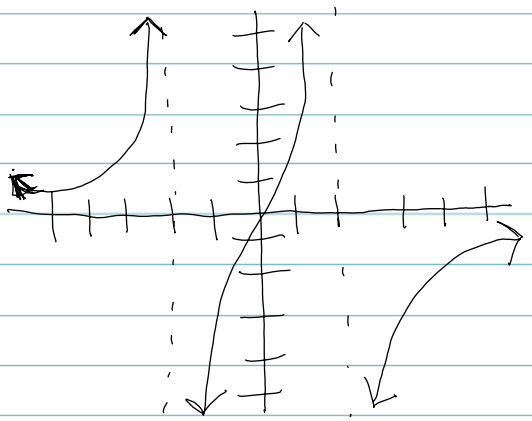
$x \neq 2 \quad x \neq -2$

D: $\mathbb{R}$ except 2 or -2



$(-\infty,-2) \cup (-2,2) \cup (2,\infty)$

asymptotes

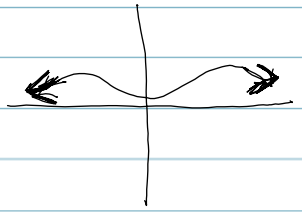


ex. 2

$$f(x) = \frac{7}{x^2+9} = \frac{7}{(x-3)(x-3)}$$

$a^2 + b^2 = \text{prime}$

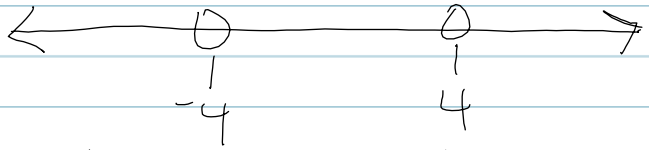
D: $\mathbb{R}$ (denominator didn't factor)



ex. 3 $$f(x) = \frac{x+4}{x^2-16} = \frac{x+4}{(x-4)(x+4)}$$

$x \neq -4 \quad x \neq 4$

D: $\mathbb{R}$ except 4 & -4



$(-\infty,-4) \cup (-4,4) \cup (4,\infty)$

OCTOBER 3, 2012 Section 6.1 Cont. NOTES

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

Dividing Fractions $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$

Simplify → 1) factor
2) cancel like factors

Ex. 1 $\frac{x+3}{3+x} = \frac{(x+3)}{(x+3)} = 1$

Ex. 2 $\frac{x-3}{3-x} = \frac{x-3}{-x+3} = \frac{x-3}{-1(x-3)} = -1$

#20 Simplify

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

$= \frac{4}{x^2-x+1}$

x^3+1
$a=x \quad b=1$

$a^3+b^3=(a+b)(a^2-ab+b$
$(x+1)(x^2-x+1)$

DOMAIN: $\frac{4(x+1)}{(x+1)(x^2-x+1)} =$ $\mathbb{R}$ except -1

$x \neq -1$

Section 6.1 CONT OCTOBER 3, 2012

#150 Divide & simplify

$$\frac{x^2-4}{3x+6} \div \frac{2x^2-8x+8}{x^2+4x+4}$$

$$\frac{x^2-4}{3x+6} \cdot \frac{x^2+4x+4}{2x^2-8x+8}$$

SCRATCH PAPER
$2x^2-8x+8$
$2(x^2-4x+4)$
$2(x-2)(x-2)$

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

ANS $\boxed{\frac{(x+2)^2}{6(x-2)}}$

#160

$$\frac{x^2+x-2}{3y^2-5y-2} \cdot \frac{12y^2+y-1}{x^2+4x-5} \div \frac{8y^2-6y+1}{5y^2-9y-2}$$

$$\frac{(x+2)(x-1)}{(3y+1)(y-2)} \quad \frac{(4y-1)(3y+1)}{(x+5)(x-1)} \quad \frac{(5y+1)(y-2)}{(4y-1)(2y-1)}$$

$$\frac{(x+2)(x-1)}{(3y+1)(y-2)} \cdot \frac{(4y-1)(3y+1)}{(x+5)(x-1)} \cdot \frac{(5y+1)(y-2)}{(4y-1)(2y-1)}$$

ANS $\boxed{\frac{(x+2)\cdot(5y+1)}{(x+5)(2y-1)}}$

AC Method. $8y^2-6y+1$
$ac=(8)(1)=+8$

+
$8 \mid 1 = 9$
$-4 \mid -2 = -6$

$8y^2-4y-2y+1$
$4y(2y-1)-1(2y-1)$
ANS $\boxed{(2y-1)(4y-1)}$

OCTOBER 5, 2012

6.1 HOMEWORK ?'s 41, 35

#41 $\frac{10a^2-12a}{4a^2+4a+1} \cdot \frac{4a^2+8a+3}{4a^2-9}$

$\frac{2a(3a-2)}{4a^2+4a+1} \cdot \frac{4a^2+8a+3}{4a^2-9}$

BOTTOMS UP Method

$4a^2+8a+3$ (4·3)

mult

$a^2+8a+12$ $-12\cdot 1,\ 6\cdot 2,\ 3\cdot 6$

$(a+\frac{6}{4})(a+\frac{2}{4})$

$(a+\frac{3}{2})(a+\frac{1}{2})$

$(2a+3)(2a+1)$

procedure ax^2+bx+c

(1) multiply $(a)(c)$ & replace the old c with the product

(2) factor

(3) divide the second part of each factor by the original a

(4) reduce if possible the new fraction

(5) If a # remains in the denominator part then multiply that # by the first term in each group. → ( )

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

$\frac{(a+\frac{2}{4})(a+\frac{2}{4})}{(a+\frac{1}{2})(a+\frac{1}{2})}$

$(2a+1)(2a+1)$

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

ANS $\boxed{\frac{2a(3a-2)}{(2a+1)(2a-3)}}$

OCTOBER 5, 2012 6.1
+Homework Cont.

(#41) $\frac{a^3+a^2b+a+b}{5a^3+5a} \cdot \frac{6a^2}{2a^2-2b^2}$

$\frac{a^3+a^2b+a+b}{5a(a^2+1)} \cdot \frac{6a^2}{2(a^2-b^2)}$

$\frac{(a+b)(a^2+1)}{5a(a^2+1)} \cdot \frac{3\,6a^2}{1\,2(a-b)(a+b)}$

$\frac{3a}{5(a-b)}$

*Scratch paper

a^3+a^2b+a+b

$a^2(a+b)+1(a+b)$

$(a+b)(a^2+1)$

OCTOBER 5, 2012 Section 6.2 Adding & Subtracting Rational Expressions

ex. $\frac{2}{3}+\frac{5}{12}-\frac{7}{30}$

2 | 12
2 | 6
3

2 | 60 (LCDs)
2 | 30
3 | 15
5

2 | 30
3 | 15
5

$3 = 3^1$
$12 = 2^2 \cdot 3^1$
$30 = 2^1 \cdot 3^1 \cdot 5^1$

$lcd = 2^2 \cdot 3^1 \cdot 5^1$

$4 \cdot 3 = 12 \cdot 5 = 60$

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

$\frac{2(x+1)+7(x-3)}{(x-3)(x+1)}$ LCD

$lcd = (x-3)(x+1)$

$\frac{2x+2+7x-21}{lcd}$

$2x+2+7x-21$

$\frac{9x-19}{(x-3)(x+1)}$ ANS