09/07 **Objectives**

- Review Homework Questions
- Section 7.1 Rational Expressions and Functions
- Section 7.2 Multiplication and Division
- Section 7.3 Addition, Subtraction, and Least Common Denominators
- Section 7.4 Addition and Subtraction with Unlike Denominators
- Homework:
  - Concept Review
    - Pg. 511 #1-6
    - Pg. 518 #1-6
    - Pg. 526 #1-4
    - Pg. 534 #1-4
  - Mixed Review
    - Pg. 538 #1-20

Homework

pg 470 #10

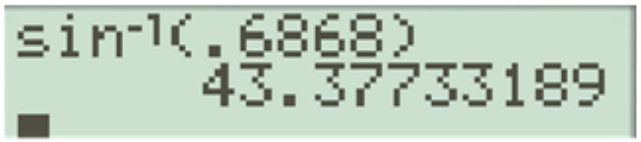
$$14x^3 - 2x = 2x(7x^2 - 1)$$

none of the special rules

#4 $9x^2 + 25$

Trig

9) $\sin\Theta = .6868$



ex) $9x^2 - 25$

$(3x)^2 - (5)^2 = (3x+5)(3x-5)$

pg 470 #5

$1000x^3 + 1$

$(10x)^3 + (1)^3 =$

$(10x+1)((10x)^2 + (10x)(1) + (1)^2)$

$(10x+1)(100x^2 + 10x + 1)$

Pg 495 #19

$81x^4 - 1$

$(9x^2)^2 - (1)^2$

$(9x^2+1)(9x^2-1)$

$(3x)^2 - (1)^2$

$(9x^2+1)(3x+1)(3x-1)$

PS 495 #25

$2x^8 - 16x^6$

$2x^6(x^2 - 8)$

#21

$27x^3 - 8$

$(3x)^3 - (2)^3$

$(3x - 2)((3x)^2 + (3x)(2) + (2)^2)$

$(3x - 2)(9x^2 + 6x + 4)$

Pg 495 #27

$$75 + 12x^2 - 60x$$

$$3(4x^2 - 20x + 25) \qquad 100 = -10 \cdot -10$$

$$4x^2 - 10x) - 10x + 25 \qquad -20 = -10 + -10$$

$$2x(2x - 5) - 5(2x - 5)$$

$$3(2x - 5)(2x - 5)$$

Pg 495 #28

$30 = 15 \cdot 2$

$17 = 15 + 2$

$$6x^2 + 17xy + 5y^2$$

$$6x^2 + 15xy + 2xy + 5y^2$$

$$3x(2x + 5y) + y(2x + 5y)$$

$$(3x + y)(2x + 5y)$$

Rational Functions

$$\frac{3}{4}, \frac{x}{y}, \frac{9}{x+3}, \frac{x^2+7x-12}{(x+2)(x-4)}$$

pg 511
#16

$$\frac{x-8}{x+7}$$

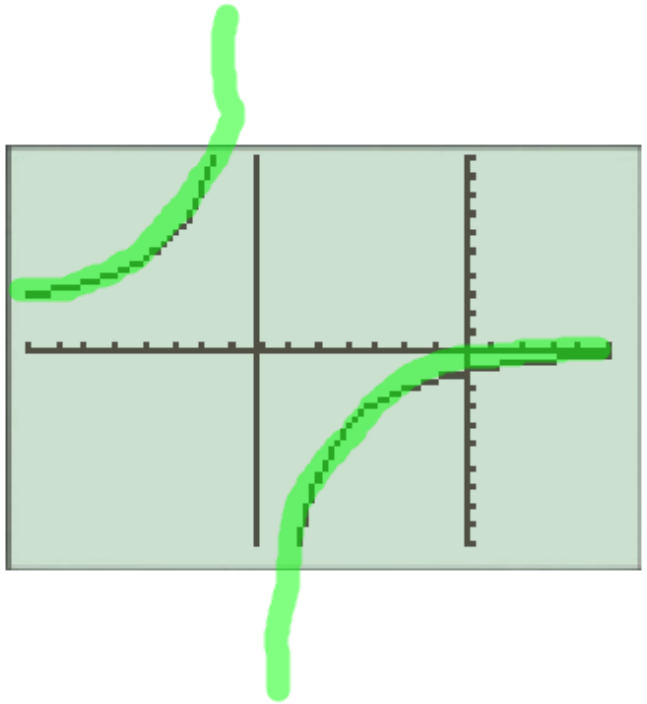
$x+7 \neq 0$

$x \neq -7$

$\uparrow$

Domain

Vertical Asymptote



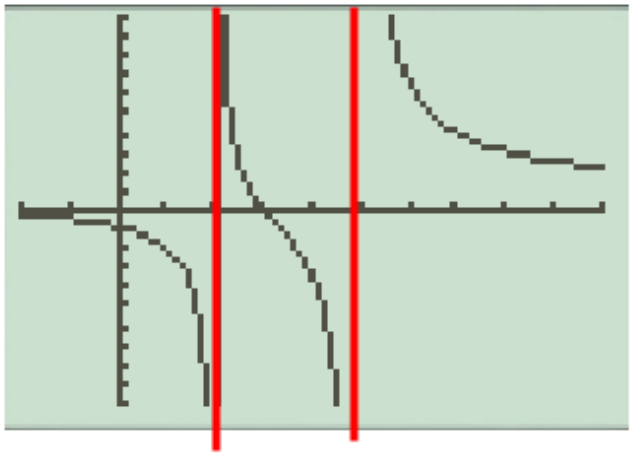
#20 $\dfrac{x^2-9}{x^2-7x+10}$ $x \neq 2, 5$

$x^2-7x+10 \neq 0$

$(x-2)(x-5) \neq 0$

$x-2 \neq 0$ $\quad$ $x-5 \neq 0$

$x \neq 2$ $\quad$ $x \neq 5$



77 $f(x) = \dfrac{x^2 - x - 6}{x^2 - 6x + 8}$ $x \neq 2, 4$

$x^2 - 6x + 8$

$x^2 - 4x - 2x + 8$

$8 = -4 \cdot -2$

$-6 = -4 + -2$

$x(x-4) - 2(x-4)$

$(x-2)(x-4)$

$x - 2 \neq 0$

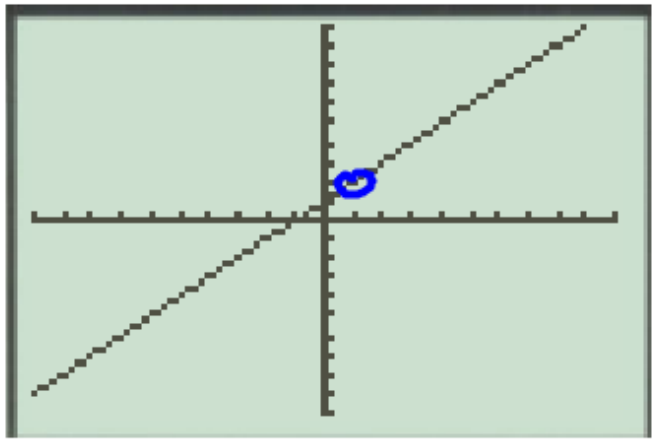
$x \neq 2$

$x - 4 \neq 0$

$x \neq 4$

#40

$$\frac{x^2-1}{x-1} \qquad x \neq 1$$



$$\frac{(x-1)(x+1)}{(x-1)}$$

$$x+1$$

#50

$$\frac{x^2-16}{x^2-8x+16}$$ 4^2 → -4 -4

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

#56

$$\frac{x^3-27}{5x^2+15x+45} = \frac{(x-3)(x^2+3x+9)}{5(x^2+3x+9)}$$

$$A^3-B^2=(A-B)(A^2+AB+B^2)$$

$$x^3-27$$

$$(x)^3-(3)^3=(x-3)(x^2+3x+9)$$

$$5x^2+15x+45$$

$$5(x^2+3x+9)$$

$$\frac{x-3}{5}$$

Multiply Rational Functions

$$\frac{2}{3} \times \frac{9}{5} = \frac{18}{15} = \frac{6}{5}$$

$$\frac{2}{\cancel{3}\,1} \times \frac{\cancel{9}^{\,3}}{5} = \frac{6}{5}$$

pg 518

#16 $\dfrac{3x^{2}y}{2} \cdot \dfrac{y^{2}}{xy^{3}} = \dfrac{6x}{y^{2}}$

pg 518

20

$$\frac{x+2}{x-2} \cdot \frac{x^2-5x+6}{(x+2)^2} = \frac{x-3}{x+2}$$

$(x-3)(x-2)$

$(x+2)(x+2)$

x^2-5x+6

$(x-3)(x-2)$

$6 = -3 \cdot -2$

$-5 = -3 + -2$

$x^2 = x \cdot x$

pg 518 #29

$$\frac{5x^2-180}{10x^2-10} \cdot \frac{20x+20}{2x-12}$$

$$\frac{5(x^2-36)}{10(x^2-1)} \cdot \frac{20(x+1)}{2(x-6)}$$

$(x)^2 - (6)^2$

$x^2 - 1^2$

$$\frac{5(x-6)(x+6)}{10(x-1)(x+1)} \cdot \frac{20(x+1)}{2(x-6)} = \frac{5(x+6)}{(x-1)}$$

Division of fractions

$$\frac{5}{8} \div \frac{4}{25} = \frac{5}{8} \times \frac{25}{4} = \frac{125}{32}$$

Pg 519
#63

$$\frac{25x^2-4}{x^2-9} \div \frac{2-5x}{x+3}$$

$(5x)^2 \quad -(2)^2$

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

$$-5x+2$$

$$-(5x-2)$$

$$-\frac{(5x+2)}{(x-3)}$$

#69 $\dfrac{x^2+10x+21}{x^2-2x-15} \div 5x^2+32x-21$

$$\frac{(x+3)(x+7)}{(x-5)(x+3)} \cdot \frac{1}{(x+7)(5x-3)} = \frac{1}{(x-5)(5x-3)}$$

$5x^2+32x-21$

$-105 = 35 \cdot -3$

$32 = 35 + -3$

$5x^2-3x+35x-21$

$x(5x-3)+7(5x-3)$

$(x+7)(5x-3)$

Addition + Subtraction

$$\frac{3}{8} + \frac{7}{8} = \frac{10}{8} = \frac{5}{4}$$

$$\frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$$

Pg 526

#5 $\frac{6}{x} + \frac{4}{x} = \frac{10}{x}$

#7 $\frac{x}{12} + \frac{2x+5}{12} = \frac{3x+5}{12}$

#13

$$\frac{3x+8}{2y} - \frac{x+1}{2y} = \frac{(3x+8) - (x+1)}{2y}$$

$$= \frac{2x+7}{2y}$$

#23

$$\frac{x^2-5x}{x-1}+\frac{5x-x^2}{x-1}=\frac{0}{x-1}=0$$

#24 $$\frac{y^2+6y}{y+2} + \frac{2y+12}{y+2} = \frac{y^2+8y+12}{y+2}$$

$$\frac{(y+6)\cancel{(y+2)}}{\cancel{(y+2)}}$$

$y+6$

#31

$$\frac{2x^2+3}{x^2-8x+12} - \frac{x^2-2x+10}{x^2-8x+12}$$

$-x^2+2x-10$

$$\frac{x^2+2x-7}{(x-6)(x-2)} =$$