Sept. 6, 2017

Warmup:

$$\frac{2x^2+5x-12}{x^2-x-20} - \frac{3x^2-11x-20}{x^2-25}$$

A $2x^2+5x-12$

m: $-24$
a: $5$

$\cancel{-1 \quad 24}$

$\cancel{-2 \quad 12}$

$\boxed{-3 \quad 8}$

$= 2x^2+8x-3x-12$

$= 2x(x+4)-3(x+4)$

$= \boxed{(x+4)(2x-3)}$

(C) $3x^2-11x-20$ m: $-60$
a: $-11$
$4, -15$

$= 3x^2-15x + 4x-20$

$= 3x(x-5)+4(x-5)$

$= \boxed{(x-5)(3x+4)}$

(B) $x^2-x-20$ m: $-20$
a: $-1$ $4, -5$

$= \boxed{(x+4)(x-5)}$

D $x^2 - 25$

$= \boxed{(x+5)(x-5)}$

diff. of squares

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

stating restrictions so denominator $\neq 0$

$x \neq -4, 5, -5,$

$$= \frac{2x-3}{x-5} - \frac{3x+4}{x+5}$$

$$= \frac{(2x-3)(x+5)}{(x-5)(x+5)} - \frac{(3x+4)(x-5)}{(x+5)(x-5)}$$

FOIL numerators then add

$$= \frac{2x^2+10x-3x-15 - [3x^2}{(x-5)(x+5)}$$

$$= \frac{2x^2+7x-15-3x^2+11x+}{(x-5)(x+5)}$$

$$= \frac{-x^2+18x+5}{(x-5)(x+5)}, \; x \neq \pm 5; 4$$

$$\frac{3}{4} + \frac{2}{4} = \frac{5}{8}$$

$$\underline{-15x + 4x - 20]}$$

$\underline{20}$

# More Review

**Ex. 1**: If $f(x) = 2x^2 - x - 6$

a) Graph $f(x)$ using vertex, roots, y-int

b) Find $f^{-1}(x)$, state the domain + range, graph $f^{-1}(x)$

roots : set $y=0$ and factor

$0 = 2x^2 - x - 6$    m: $-12$   $-4, 3$
a: $-1$

$0 = 2x^2 - 4x + 3x - 6$

$0 = 2x(x-2) + 3(x-2)$

$0 = (x-2)(2x+3)$

$x - 2 = 0$ or $2x + 3 = 0$

$\boxed{x = 2}$

$2x = -3$

$\boxed{x = -3/2}$

$(2, 0)$

$\left(-\frac{3}{2}, 0\right)$

vertex: $y=a(x-h)^2+k$

$f(x)=\underbrace{2x^2-x}-6$

$f(x)=2(x^2\underbrace{-\tfrac{1}{2}x})-6$

$\left(\dfrac{-\frac{1}{2}}{2}\right)^2=\left(-\dfrac{1}{4}\right)^2=\boxed{\dfrac{1}{16}}$

take boxed term put it inside bracket,

$=2(\underbrace{x^2-\tfrac{1}{2}x\underbrace{+\tfrac{1}{16}}}-\tfrac{1}{16})-6$

multiply 2 by $-\frac{1}{16}$

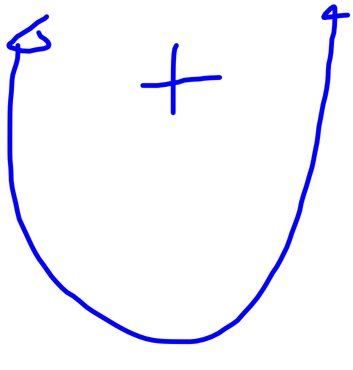
$$= 2\underbrace{\left(x^2 - \frac{1}{2}x + \frac{1}{16}\right)} - \frac{1}{8} - 6$$

$$= 2\left(x - \frac{1}{4}\right)^2 - 6\frac{1}{8}$$

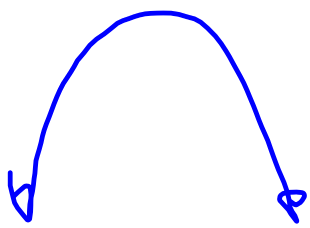
vertex $\left(\frac{1}{4}, -6\frac{1}{8}\right)$

opens up $(a = 2)$

$+$



$-$



HW p.2

#1, 2, 4, 5, 6, 8, 11, 12