

Review

Function Notation:

recall: $f(x) = 2x - 3$

name (under f) *input values* (under x) *"rule" = output values* (under $2x - 3$)

$$\begin{aligned} \text{a) } f(2) & \\ &= 2(2) - 3 \\ &= 4 - 3 \\ &= 1 \end{aligned}$$

$$\begin{aligned} \text{b) } f(t) & \\ &= 2t - 3 \end{aligned}$$

$$\begin{aligned} \text{c) } f(3a) & \\ &= 2(3a) - 3 \\ &= 6a - 3 \end{aligned}$$

$$\begin{aligned} \text{d) } f(x) &= 17 \\ 2x - 3 &= 17 \\ \frac{2x}{2} &= \frac{20}{2} \\ x &= 10 \end{aligned}$$

$$\begin{aligned} \text{e) } 2f(3) + 10 & \\ &= 2[2(3) - 3] + 10 \\ &= 2(6 - 3) + 10 \\ &= 2(3) + 10 \\ &= 16 \end{aligned}$$

Factoring:

ex // $5x^2y + 10x^3y^4 + 30x^4y$

Common Factor:

always happens first

$$= 5x^2y (1 + 2xy^3 + 6x^2)$$

Trinomial factor:

Simple $1x^2 - 4x - 12$
 $= (x - 6)(x + 2)$

observation

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

$-5x$

Not-simple (Decomposition)

$$2x^2 - 5x - 12$$

-24

$$\begin{array}{r} -8 \cdot 3 = -24 \\ -8 + 3 = -5 \end{array}$$

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

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

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

Special factors:

Perfect square $\sqrt{4a^2 - 20a + 25}$
 $= (2a - 5)^2$

Difference of squares

ex // $y^2 - 16$
 $= (y - 4)(y + 4)$

ex // $81x^4 - 16$
 $= (9x^2 - 4)(9x^2 + 4)$
 $= (3x - 2)(3x + 2)(9x^2 + 4)$

Solving Equations:

Linear Equations:

$$2x + 9 = 3x + 2 \quad (3x + 22)$$

$$2x + 9 = 3x + 6x + 44$$

$$2x - 3x - 6x = 44 - 9$$

$$\frac{-7x}{-7} = \frac{35}{-7}$$

$$x = -5$$

Quadratic Equations:

* use the quadratic formula
* factor

ONLY if one side equals zero!!

$$\text{ex/ } 2x^2 - 5x = 12$$

$$2x^2 - 5x - 12 = 0$$

$$(2x + 3)(x - 4) = 0$$

$$2x + 3 = 0$$

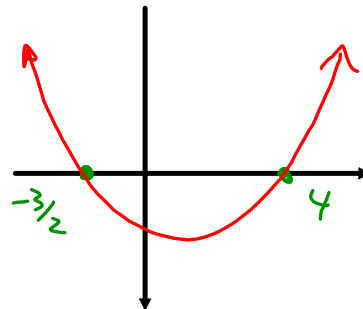
$$x = -\frac{3}{2}$$

$$x - 4 = 0$$

$$x = 4$$

$$\Delta = b^2 - 4ac$$

discriminant



Rational Expressions: "fraction"

↳ has a denominator $\neq 0$

↳ state restrictions

add/sub: $\frac{x^2 - 2x - 15}{x^2 - 4} - \frac{2x - 1}{x - 2}$

$$= \frac{(x - 5)(x + 3)}{(x + 2)(x - 2)} - \frac{(2x - 1)(x + 2)}{(x - 2)(x + 2)}$$

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

$$= \frac{-x^2 - 5x - 13}{(x + 2)(x - 2)} = \frac{-(x^2 + 5x + 13)}{(x + 2)(x - 2)}$$

$$x \neq \pm 2$$

divide: $\frac{2x^2 - 9x + 9}{x^2 - 2x - 8} \div \frac{2x^2 - 5x + 3}{x^2 - 3x - 4}$

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

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

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

$$x \neq 4, -2, -1, 2$$



HOMEFUN:



Finish Introductory Assignment