

$$2 - 3[(5 - 10) - (3 - 2^2)]$$

$$= 2 - 3[-5 - (3 - 4)]$$

$$= 2 - 3[-5 - (-1)]$$

$$= 2 - 3[-5 + 1]$$

$$= 2 - 3[-4]$$

~~$$= -1[-4] = 4$$
 Most common mistake~~

$$= 2 + 12$$

$$= 14$$

$$4(7x+3) - 1(x+2)$$

$$4(7x) + 4(3) - 1(x) - 1(2)$$

is one way

$$4(7x) + 4(3) + (-1)(x) + (-1)(2)$$

is another.

$$28x + 12 - x - 2$$

$$= 27x + 10$$

$$28x + 12 - x - 2$$

$$= 27x + 10$$

write Much
Think Little



$$* 4(7x)$$

$$= (4 \cdot 7)(x)$$

$$(ab)c = a(bc)$$

associative
property

$$a^b \cdot a^c = a^{b+c}$$

$$(2x^2 - 1)(3x^2 + 4)$$

$$= (2x^2)(3x^2) + (2x^2)(4) + (-1)(3x^2) + (-1)(4)$$

$$= (2)(3)(x^2)(x^2) + (2)(4)(x^2) + (-1)(3)(x^2) - 4$$

$$6x^4$$

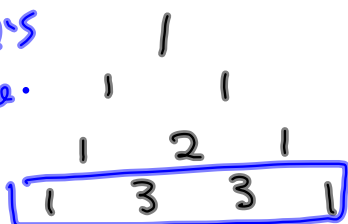
$$+ \underline{8x^2} - \underline{3x^2} - 4$$

$$= 6x^4 + 5x^2 - 4$$

$$\begin{aligned}(3x-4y)^2 &= \bullet \quad \text{http://www.mathstv.com/videos_by_textbook?id=4#} \\ &= (3x-4y)(3x-4y) \quad \text{VIDEO LECTURE!} \\ &= (3x)(3x) + (3x)(-4y) + (-4y)(3x) + (-4y)(-4y) \quad \text{If this lec. falls short...} \\ &= 9x^2 - 12xy - 12xy + 16y^2 \\ &= 9x^2 - 24xy + 16y^2\end{aligned}$$

An aside

Pascal's Triangle.



$$(3x-4y)(3x-4y)$$

$$= (3x-4y)^2$$

Square of a Binomial

$$= 1(3x)^2(-4y)^0 + 2(3x)^1(-4y)^1 + 1(3x)^0(-4y)^2$$

$$= 9x^2 + 2(-12xy) + (-4y)^2$$

$$= 9x^2 - 24xy + 16y^2$$

$$(3x-4y)^3 \quad \text{Cube of a binomial.}$$

$$= 1(3x)^3(-4y)^0 + 3(3x)^2(-4y)^1 + 3(3x)^1(-4y)^2 + 1(3x)^0(-4y)^3$$

$$= 27x^3 + 3(9x^2) \quad \text{Finish this for Bonus homework.}$$

① Power Distributes over product the way

② Product Distributes over sums.

$$\textcircled{1} (ab)^c = a^c b^c$$

$$\textcircled{2} c(a+b) = ca + cb$$

$(a+b)^c$ how to handle THAT?

$= a^c + b^c$ is most common student misconception.

Powers Do NOT distribute over Sums.

$$(2+3)^2 = 25$$

$$2^2 + 3^2 = 13$$

See? They ain't the same.

$$x^2 + 7x + 12$$

$$\begin{array}{r} 2 \overline{)12} \\ \underline{2} \\ 6 \\ \underline{6} \\ 0 \end{array}$$

Want product of 12
whose sum is 7

$$2 \cdot 2 \cdot 3$$

$$2 \cdot 2 + 3$$

$$4 + 3 = 7 = \text{sum}$$

$$\begin{aligned} &= \frac{x^2 + 4x + 3x + 12}{x(x+4) + 3(x+4)} \\ &= (x+4)[x+3] = (x+4)(x+3) \end{aligned}$$

$$2, 3, 5, 7, 11, 13, 17, 19$$

Sum of 7
product of 12

$$\begin{aligned} 7 &= 1+6 & (1)(6) &= 6 \\ &= 2+5 & (2)(5) &= 10 \\ &= 3+4 & (3)(4) &= 12 \\ & & \text{woo-hoo!} & \end{aligned}$$

$$\begin{aligned} &= x^2 + 3x + 4x + 12 \\ &= x(x+3) + 4(x+3) \\ &= (x+3)(x+4) \end{aligned}$$

Factor 192 into a product of powers of primes.

$$\begin{array}{r} 2 \overline{)12} \\ 2 \overline{)6} \\ 3 \end{array}$$

$12 = 2^2 \cdot 3$

$$\begin{array}{r} 1 \quad 2 \overline{)192} \\ 2 \quad 2 \overline{)96} \\ 3 \quad 2 \overline{)48} \\ 4 \quad 2 \overline{)24} \\ 5 \quad 2 \overline{)12} \\ 6 \quad 2 \overline{)6} \\ 3 \end{array}$$

$192 = 2^6 \cdot 3$

Same for 44100!

$$\begin{array}{r} 2 \overline{)44100} \\ 2 \overline{)22050} \\ 3 \overline{)11025} \\ 3 \overline{)3675} \\ 5 \overline{)1225} \\ 5 \overline{)245} \\ 7 \overline{)49} \\ 7 \end{array}$$

$44100 = 2^2 \cdot 3^2 \cdot 5^2 \cdot 7^2$

$1+1+2+5$

325982118

= 9 is divisible by 3 so is 11025

Stop no later than \sqrt{x}

$$30a^3b^4 + 20a^4b^3$$

$$= 10a^3b^3 [3b + 2a]$$

$$= 10a^3b^3 \left[\frac{30a^3b^4}{10a^3b^3} + \frac{20a^4b^3}{10a^3b^3} \right]$$

$$= 10a^3b^3 \left[3a^{3-3}b^{4-3} + 2a^{4-3}b^{3-3} \right]$$

$$= 10a^3b^3 [3a^0b^1 + 2a^1b^0]$$

$$= 10a^3b^3 [3 \cdot 1 \cdot b + 2a \cdot 1]$$

$$= 10a^3b^3 [3b + 2a]$$

Greatest
Common
Factor

$$\begin{array}{r} \textcircled{2} \overline{)30} \\ \underline{30} \\ 0 \end{array} \quad \begin{array}{r} \textcircled{2} \overline{)20} \\ \underline{20} \\ 0 \end{array}$$

$\textcircled{5}$ $\textcircled{5}$

$$\text{GCF} = 10$$

$$a^3, a^4 : a^3$$

$$b^4, b^3 : b^3$$

$$\frac{x^8 y^3}{x^5 y^4} = x^{8-5} y^{3-4}$$

$$= x^3 y^{-1}$$

$$= \frac{x^3}{y} \quad 2^3 = 2 \cdot 2 \cdot 2 = 8$$

$$(2x^{-4})^3 = (2^3)((x^{-4})^3)$$

$$= 8x^{(-4)(3)} = 8x^{-12} = \frac{8}{x^{12}}$$

$$(a^b b^c)^d = (a^b)^d (b^c)^d$$

$$a^{bd} b^{cd}$$

$$a^b \cdot a^c$$

$$= (a^b)(a^c) = a^{b+c}$$

$$2^3 \cdot 2^7 = 2^{10}$$

$$(2^3)^7 = 2^{21} = 2^{(7)(3)} = (2^7)^3$$

$$= (2^3)(2^3)(2^3)(2^3)(2^3)(2^3)(2^3)$$

$$= (2^7)(2^7)(2^7)$$

$$\begin{array}{r} 8x - 2 = 6x - 10 \\ -6x \quad -6x \\ \hline 2x - 2 = -10 \\ +2 = +2 \\ \hline \end{array}$$

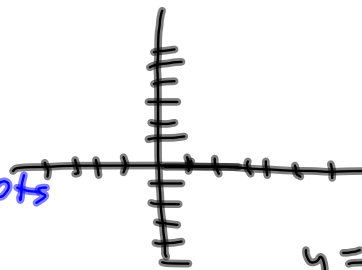
$$2x = -8 \quad \leftarrow \text{Need}$$

$$\frac{2x}{2} = \frac{-8}{2} \quad \leftarrow \text{optional}$$

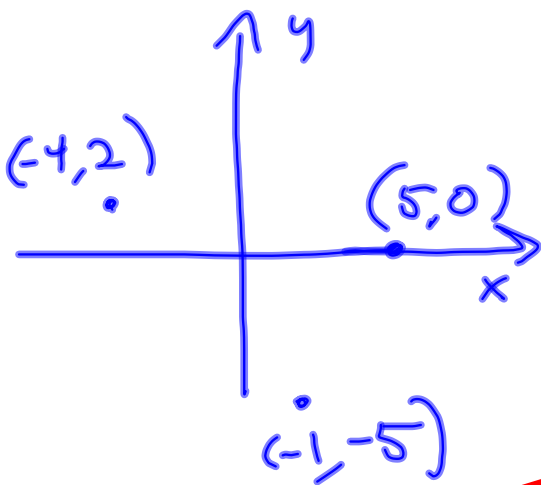
$$x = -4 \quad \leftarrow \text{Need}$$

$y = 2x - 1$
 2 most important
 points:

x- & y-intercepts



$y = 2x - 1$



x-int
 $0 = 2x - 1$
 $2x - 1 = 0$
 $+1 = +1$

 $2x = 1$

$\frac{2x}{2} = \frac{1}{2}$

$x = \frac{1}{2}$

$(\frac{1}{2}, 0)$

y-int
 $y = 2(0) - 1$
 $y = -1$
 $(0, -1)$

