

October 21, 2016

5.4 Polynomials

"+"  $(3x^2 - 9x + 2) + (-4x^2 + 3x + 5)$

~~$3x^2 - 9x + 2 - 4x^2 + 3x + 5$~~

$-x^2 - 6x + 7$

Oct 21-9:00 AM

"-"  $-x^2 = (-1) \cdot x^2$

$(5x^2 + 3) - (2x^2 - 6)$

$5x^2 + 3 - 2x^2 + 6$

$3x^2 + 9$

Oct 21-9:14 AM

$(-x^3 + 2x^2 - x + 4) - (4x^3 + 2x) + (6x^2 + 5)$

~~$-x^3 + 2x^2 - x + 4 - 4x^3 - 2x + 6x^2 + 5$~~

$-5x^3 + 8x^2 - 3x + 9$

Oct 21-9:17 AM

5.5 Laws of Exponents

\* The meaning of an Exponent

$a^n$  ← Exponent

↑ Base

$= \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_n$

n factors of a

↓ Multiplication

Oct 21-9:21 AM

Laws (Rules)

① Product Rule of Exponents

meaning  $x^3 \cdot x^2 = \underbrace{x \cdot x \cdot x}_{\text{same base}} \cdot \underbrace{x \cdot x}_{\text{same base}}$

$= x^5$

Rule  $x^3 \cdot x^2 = x^{3+2=5}$

$= x^5$

Oct 21-9:26 AM

② Power Rule

meaning  $(x^3)^2 = \underbrace{x^3 \cdot x^3}_{\text{base}}$

$= x \cdot x \cdot x \cdot x \cdot x \cdot x$

$= x^6$

Rule  $(x^3)^2 = x^6$

Oct 21-9:32 AM

③ Quotient Rule

Meaning  $\frac{x^3}{x^2} = \frac{\boxed{x} \cdot \boxed{x} \cdot x}{\boxed{x} \cdot \boxed{x} \cdot 1}$

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

Rule  $\frac{x^3}{x^2} = x^{3-2=1} = x^1 = x$

Oct 21-9:35 AM

M  $\frac{x^2}{x^3} = \frac{\boxed{x} \cdot \boxed{x} \cdot 1}{\boxed{x} \cdot \boxed{x} \cdot x} = \frac{1}{x}$

Rule  $\frac{x^2}{x^3} = x^{2-3=-1} = x^{-1}$

Oct 21-9:38 AM

④ Negative Exponent Rule

a.  $a^{-n} = \frac{1}{a^n}$

$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

b.  $\frac{1}{a^{-n}} = \frac{a^n}{1} = a^n$

why?  $\frac{\frac{1}{a^{-n}}}{\frac{1}{a^n}} = \frac{1}{1} \cdot \frac{a^n}{1} = a^n$

$\frac{1}{2^{-3}} = \frac{2^3}{1} = \frac{8}{1} = 8$

Oct 21-9:40 AM

M  $\frac{x^3}{x^3} = \frac{\boxed{x} \cdot \boxed{x} \cdot \boxed{x}}{\boxed{x} \cdot \boxed{x} \cdot \boxed{x}} = 1 \cdot 1 \cdot 1 = 1$

Rule  $\frac{x^3}{x^3} = x^{3-3=0} = x^0$

Oct 21-9:44 AM

$x^2 + 3x + 9$

$1 \cdot x^2 + 3 \cdot x^1 + 9 \cdot x^0$

Oct 21-9:47 AM