Review

Turn in HW #10
- 10.1 #7,9,23-31odd, #59,63,67
- 10.2 #9,15,19,21,25,29,35,37
- 10.3 #15,19,21,25,35,37,43,45,49,57

Write an equation for $y = \sqrt[3]{x}$, but flipped vertically, stretched vertically by a factor of 4, shifted down 5, and shifted right 2.

$$y = -4\sqrt[3]{x-2} - 5$$

Determine whether the function is even, odd, or neither.

$$f(x) = -5x^2 + \frac{3}{x^4} - 7$$

$$f(-x) = -5(-x)^2 + \frac{3}{(-x)^4} - 7$$

$$= -5x^2 + \frac{3}{x^4} - 7 = f(x) \Rightarrow \boxed{\text{even}}$$

The Binomial Theorem:

$$(a+b)^n = \sum_{k=0}^{n} \binom{n}{k} a^{n-k} b^k$$

In particular,

The $(k+1)^{st}$ term of $(a+b)^n$ is

$$\binom{n}{k} a^{n-k} b^k$$

Find the 5th term of $(p-2q)^9$

$5^{th} = (4+1)^{st}$

$a = p$
$b = -2q$
$n = 9$
$k = 4$

5th term: $\binom{9}{4}(p)^{9-4}(-2q)^4$

$= \frac{9!}{4!(9-4)!}p^5(16q^4)$

$= \frac{\cancel{9}^{3}\cdot\cancel{8}\cdot 7\cdot 6\cdot\cancel{5!}}{\cancel{4}\cdot\cancel{3}\cdot\cancel{2}\cdot 1\cdot\cancel{5!}}(16p^5q^4)$

$= 3\cdot 7\cdot 6\cdot 16\,p^5q^4 = \boxed{2016p^5q^4}$

$= 2016p^5q^4$

Given a set with n objects, the # of subsets containing k elements is $\binom{n}{k}$,
so the total # of subsets of any size is $\binom{n}{0}+\binom{n}{1}+\binom{n}{2}+\dots+\binom{n}{n}$

$(1+1)^n = \binom{n}{0}1^{n-0}1^0 + \binom{n}{1}1^{n-1}1^1 + \binom{n}{2}1^{n-2}1^2 + \dots + \binom{n}{n}1^{n-n}1^n$

$2^n = \binom{n}{0}+\binom{n}{1}+\binom{n}{2}+\binom{n}{3}+\dots+\binom{n}{n}$

How many "words" can we write with the English alphabet, which has 26 letters?

$2^{26} = 67{,}108{,}864$

# of groups of any size of class of 11 students:

$2^{11} = 2048$

find the 8th term of $(3x-y)^{15}$

$a = 3x$
$b = -y$
$n = 15$
$k = 7$
$(8 = k+1)$

$(k+1)^{st}$ term of $(a+b)^n$ is $\binom{n}{k} a^{n-k} b^k$

$\binom{15}{7}(3x)^{15-7}(-y)^7$

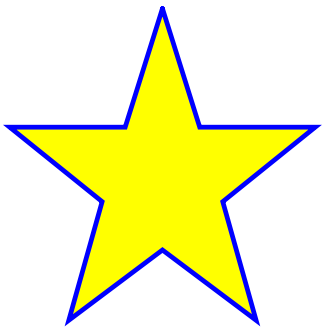
$= \frac{15!}{7!(15-7)!}(3x)^8(-y^7)$

$= \frac{\cancel{15}\cdot\cancel{14}\cdot 13\cdot\cancel{12}\cdot 11\cdot\overset{5}{\cancel{10}}\cdot 9\cdot\cancel{8!}}{\cancel{7}\cdot\cancel{6}\cdot\cancel{5}\cdot\underset{2}{\cancel{4}}\cdot\cancel{3}\cdot\cancel{2}\cdot 1\cdot\cancel{8!}}(-3^8x^8y^7)$

$= -3^8\cdot 13\cdot 11\cdot 5\cdot 9\, x^8y^7$

$= \boxed{-42220035x^8y^7}$

Quiz #5 on Matrices, Sequences, Series - **NOW!**



HW #11 (due Mon, Oct 27)

- 10.7 #1,7,21,27,31-39odd (Binomial Theorem)
- Final Exam Practice Problems

Review session - 3:30pm, Thursday 10/30

Final Exam - 9:00am, Friday 10/31

Note that your final exam average can replace your lowest test grade!

BRING YOUR TEXTBOOKS TO THE FINAL EXAM!