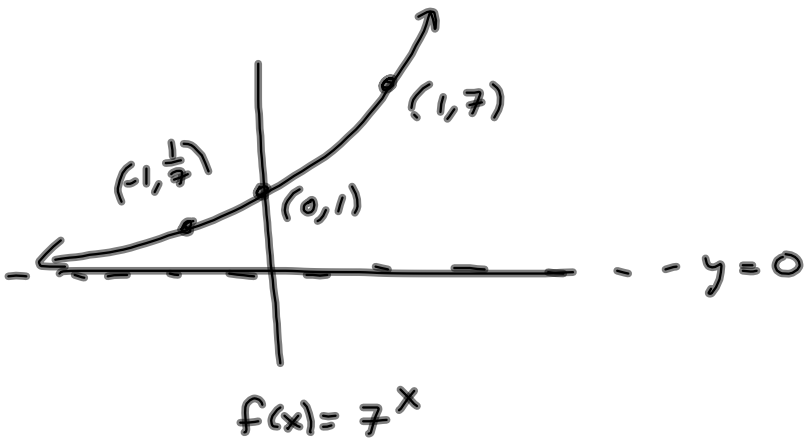


Nov 28-10:06 AM

On test.

I'll give $A = P(1+\frac{r}{m})^{mt} = P(1+i)^n$

$S = \frac{a(b^n-1)}{b-1} = \frac{a(1-b^n)}{1-b}$

$S = \frac{a((1+i)^n-1)}{i}$ for annuities

§8.4 #38 BIG # Permutations

#40 one copy of ...

1	a	War & Peace
1	b	Grapes of Wrath
1	c	Moby Dick
	d	Gone w/ the Wind
4	eeee	4 copies of Jurassic Park

How many ways to give one book to each of 8 students?

$C(8,4)\cdot P(4,4) = \frac{8!}{4!4!}\cdot 4! = \frac{8!}{4!}$

ANS: 1680

We can use the orderings

I think the Labeling Theorem

① $C(8,4)$ choose 4 students to get J.P.

② $P(4,4)$ Arrange the 4 books amongst other 4 students.

③ Multiply.

_ _ _ _ _ _ _ _

$\frac{8!}{1!1!1!4!} = 8\cdot 7\cdot 6\cdot 5 = 1680$

$\frac{n!}{n_1!n_2!n_3!\cdots n_k!}$

Rearrangements on the letters in the word Mississippi

1 2 3 4 5 6 7 8 9 10 11

34,650

$n = 11$

$n_1 = 1$ m

$n_2 = 4$ i

$n_3 = 4$ s

$n_4 = 2$ p

We divide by the rearrangements that give the same word.

Distinct 11 letters: $P(11,11) = \frac{11!}{(11-11)!} = \frac{11!}{0!} = 11!$

$\frac{11!}{2!4!4!} = \frac{11\cdot 10\cdot 9\cdot 8\cdot 7\cdot 6\cdot 5}{2\cdot 4\cdot 3\cdot 2}$

$= 11\cdot 10\cdot 9\cdot 7\cdot 5 = 34650$

Permutations: $P(4,3)$ means choose 3 & arrange them in a line.

Combinations: $C(4,3)$ means choose 3.

$$C(4,3) = \frac{4!}{(4-3)!\,3!} = \frac{4!}{1!3!} = \frac{4!}{3!} = 4$$

$\{a,b,c,d\}$:

$3! = 6$ $\{a,b,c\}, \{a,b,d\}, \{a,c,d\}, \{b,c,d\}$

$\{a\}, \{b\}, \{c\}, \{d\}$: $C(4,1)$

Perm: abc acb bac bca cab cba

Combo: $\{a,b,c\} = \{a,c,b\} = \cdots$ all the same.

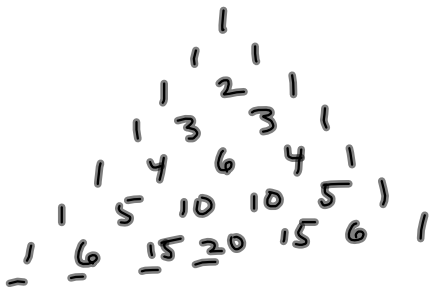
Just care who's there, not their political affiliation

$C(4,3)$: 4 choose 3

FACT: $C(4,3) = C(4,1)$

$C(n,k) = C(n,n-k)$

Pascal's Triangle is Symmetrical



These are Binomial Coefficients

$(x+y)^6 = x^6 + 6x^5y^1 + 15x^4y^2 + 20x^3y^3 + 15x^2y^4 + 6xy^5 + y^6$

$1x^6y^0$ $1x^0y^6$

$C(n,k) = C(n,n-k)$

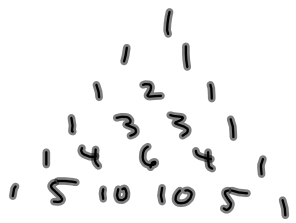
$C(6,0) = \frac{6!}{(6-0)!\,0!} = \frac{6!}{6!} = 1 = C(6,6)$

$C(6,1) = \frac{6!}{(6-1)!\,1!} = \frac{6!}{5!1!} = 6 = C(6,5)$

$C(6,2) = \frac{6!}{4!2!} = \frac{6\cdot5}{2} = 15 = C(6,4)$

$C(6,3) = \frac{6!}{3!3!} = \frac{6\cdot5\cdot4}{3\cdot2} = 20$

$(2x-5y)^5$



$= 1(2x)^5(-5y)^0 + 5(2x)^4(-5y)^1 + 10(2x)^3(-5y)^2 + 10(2x)^2(-5y)^3$

$+ 5(2x)^1(-5y)^4 + 1(2x)^0(-5y)^5$

Bonus: In Σ-notation, this is

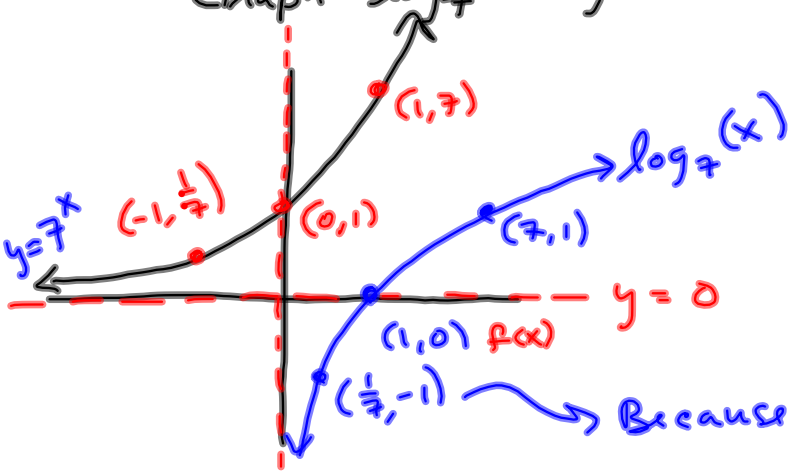
$$\sum_{k=0}^{5} C(5,k)(2x)^{5-k}(-5y)^k$$

In general, Binomial Theorem says

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

is the FORMAL statement.

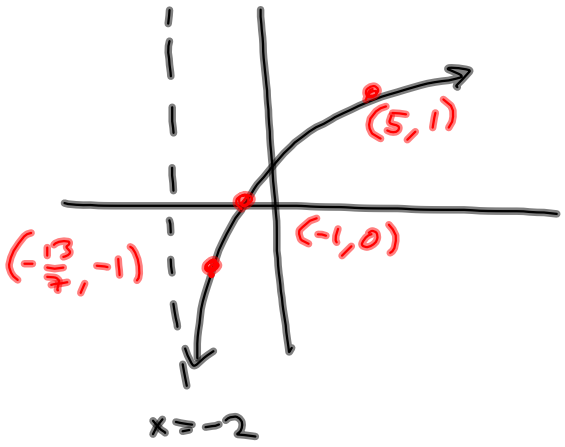
Graph $\log_7 x$ by Knowing 7^x



Because $\frac{1}{7} = 7^{-1}$ log sees the power & reports it.

$\log_7(x+2) = f(x+2)$

FINAL
Tuesday 10:10 am



$\frac{1}{7} - 2 = \frac{1-14}{7} = -\frac{13}{7}$