8/27 Math 1100 Math Cafe Lab
C301 M-Th 11-7
F 11-4

+, 1

I. Do it again Iterate Compose

1+1=2, 4 6 8

2+2+2+2 . .

3 6 9, 12, . . .

✱

II. Interaction New with old

$a(x+y) = ax + ay$

III Undo it! $x+3=5$

Solving

New #s $x = 5-3 = 2$

$x+5=3$ $x=3-5$

Undo multiplication:

$3x = 15 \quad x = 15/3 = 5/1$

$15x = 3 \quad x = 3/15 = 1/5$

IV Observe useful concepts of Equivalence

$x = 3-5 = -2 = 2-4 = 1-3$

$= 10-12$

$3/5 = 1/5 = -2/-10$

V. Visualize it:

+: Shifting Right Left up down

*: Zoom Scaling

*: Do it again

1	2	4	8	16	32	64
1	3	9	27	81	243	
1	4	16	64	256	1024	
1	5	25	125	625	3125	

2^4

3^4

4^4

5^4

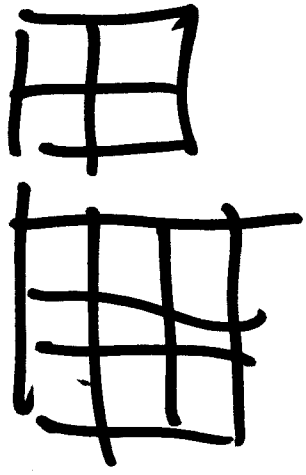
36

$\sqrt{16}$

49

q^x Exponentials

x^4 Powers



Exponential +

$$a^{x+y} = a^x a^y$$

$$2^{2+3} = 2^2 \cdot 2^3$$

$2^2 : 1 \cdot 2 \cdot 2$

$2^3 = 1 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

Exp *

$$a^{xy} = (a^x)^y$$

$(2^2)^3$ $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

Power *

$$(xy)^n = x^n y^n$$

$$(2 \cdot 3)^5 = 1 \cdot 2 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 3$$

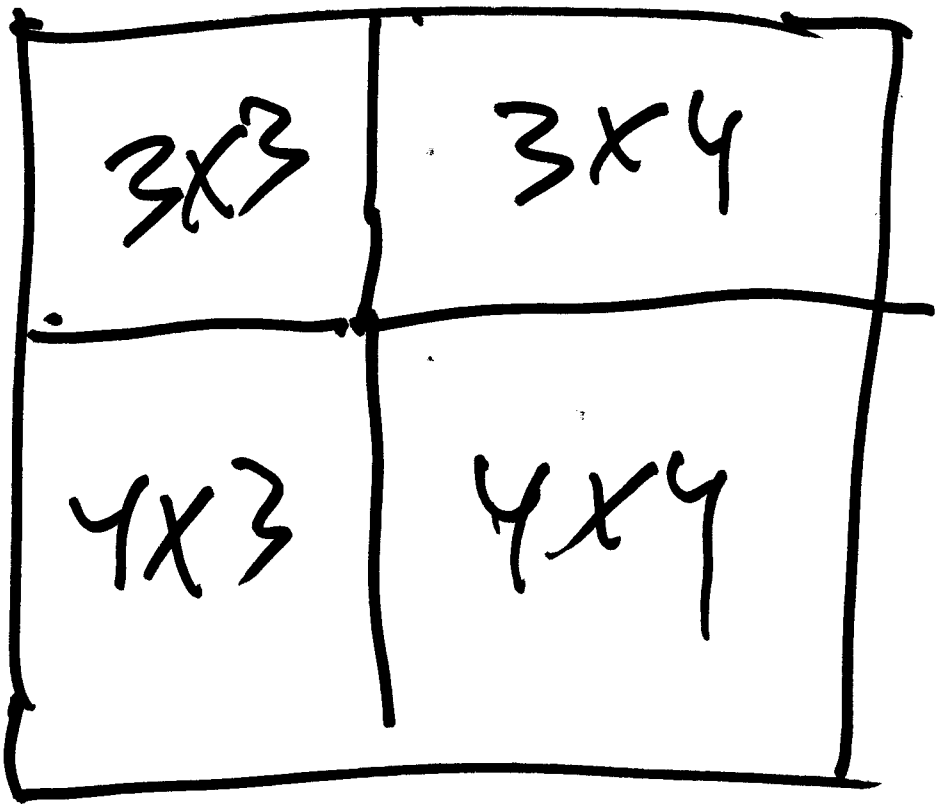
$$= 2^5 \cdot 3^5$$

Power and +

$$(x+y)^n = ?$$

$(3+4)^2 \neq 3^2+4^2$.

$(3+4)(3+4)$



$3^2+2\cdot3\cdot4+4^2$

Undo Power

$x^2 = 9$

$x = \pm\sqrt{9} = \pm 3$

$x^2 = 2$ $x = \pm\sqrt{2}$

Undo exponential

$2^n = 8$

$n = \log_2 8 = 3$

$$2^n = 3$$

$$\left(2^{p/\delta} = 3\right)^{\delta}$$

$$2^p = 3^{\delta}$$

VI What approximations approach