Exponential Equation Notes

finding the constant multiplier

increasing: 1 + % (decimal)

ex 37% increase

$1 + 0.37 = \underline{1.37}$

decreasing: 1 − % (decimal)

ex 23% decrease

$1 - 0.23 = \underline{0.77}$

recursive routine → equation

SN (x=0) → a

rule (multiplier) → b

$$\boxed{y = a(b)^x \text{ exponential equation}}$$

growth: b>1

decay: b btwn 0 & 1

examples

1. SN: 100, rule: 1.05
   → $y = 100(1.05)^x$
2. start with 400 bugs, 15% increase
   → $y = 400(1.15)^x$
3. start with 700, decreasing by 25%
   → $y = 700(0.75)^x$
4. SN: 250, rule: 0.7
   → $y = 250(0.7)^x$

from charts

* a value when x=0
* $\frac{\text{term 2}}{\text{term 1}} = b$ (must be in order)

ex

x	y
0	4
1	2
2	½
3	¼

$y = 4(\frac{1}{2})^x$

$\frac{2}{4} = \frac{1}{2} = b$ → 50% decay

ex2

x	y
0	16
1	4
3	¼
4	1/16

$y = 16(\frac{1}{4})^x$

→ 75% decay

$\frac{1/16}{1/4} = \frac{1}{4}$