$A_0 = 10{,}000$ annual growth of 9%.

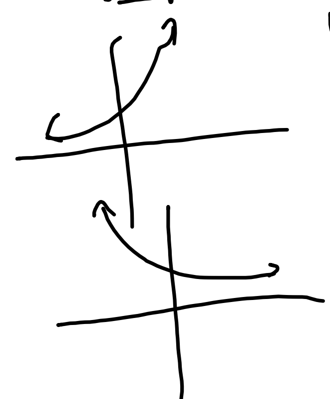
A_{65}

$A(t) = 10{,}000(1.09)^t$

$A(65) \approx 2.7 \times 10^6$

---

shape



$y = ab^x$ if $b > 1$

$y = ab^x$ $0 < b < 1$

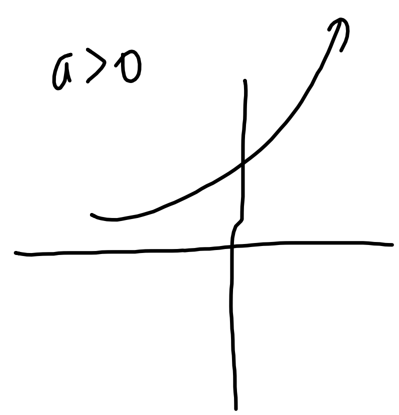
---

a: (1) it tells you the y int

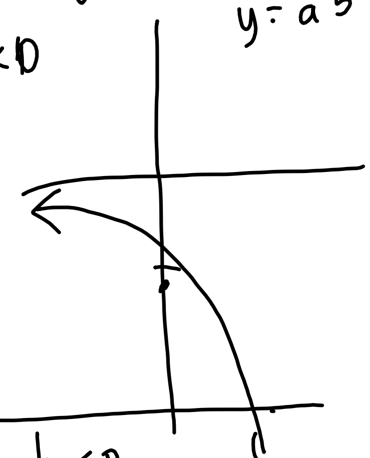
↳ or how much you start with.

$y = ab^x$

$a > 0$



$a < 0$

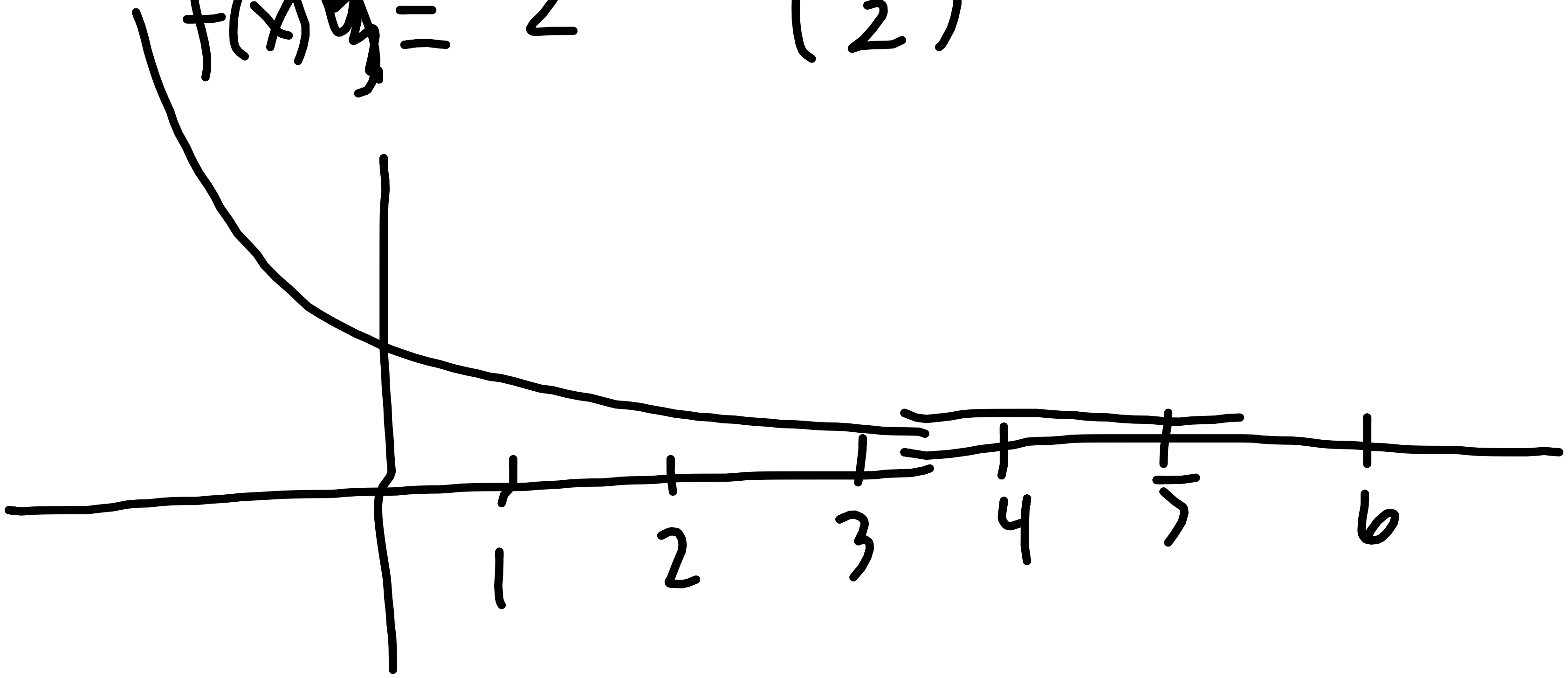


---

if we let $b < 0$

$y = (-3)^x$ throw these out.

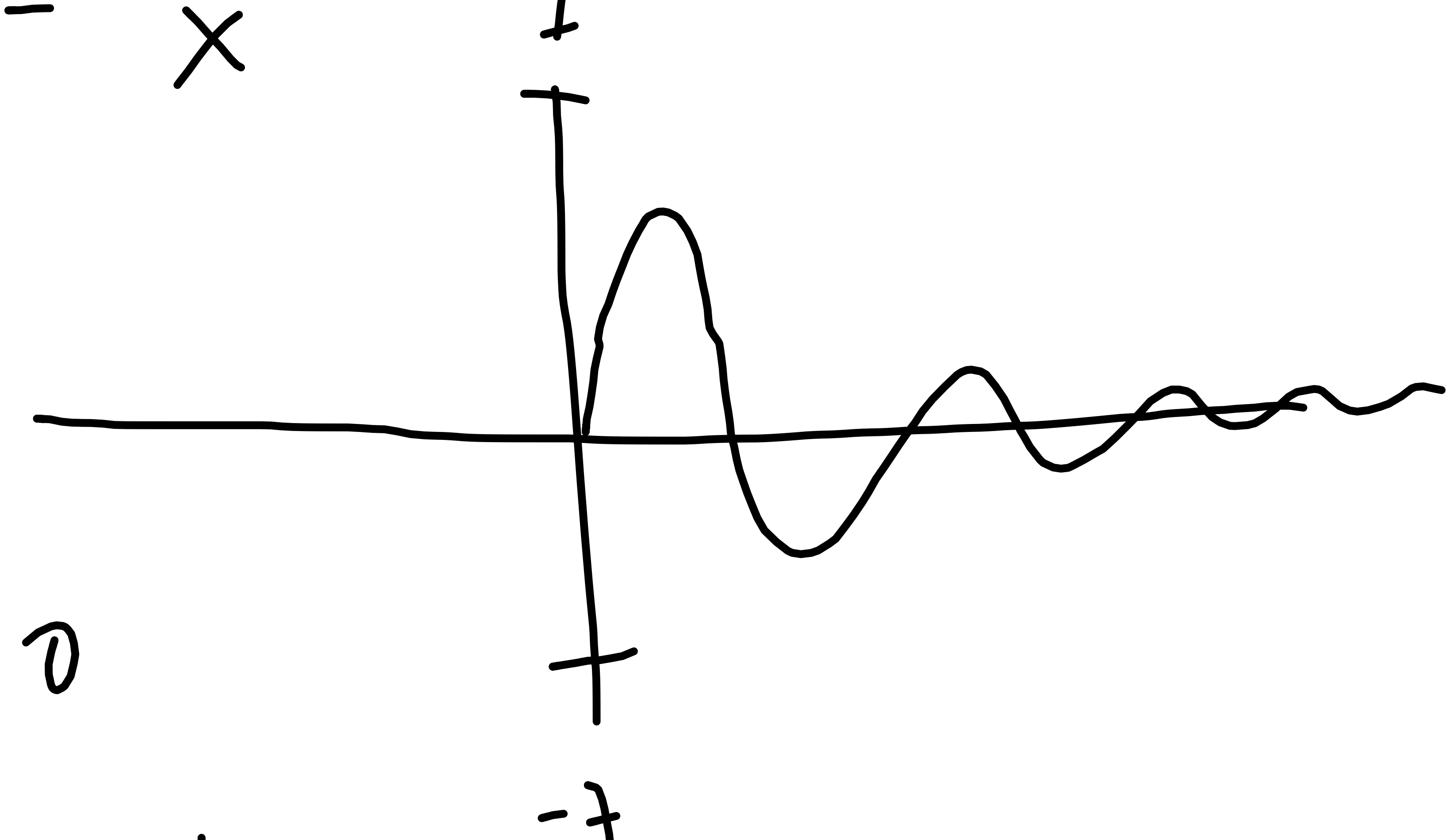
$f(x) = 2^{-x} = \left(\frac{1}{2}\right)^x$



$$\lim_{x\to\infty} f(x) = 0$$

$$\lim_{x\to-\infty} f(x) = +\infty$$

$$f(x) = \frac{\sin x}{x}$$



$$\lim_{x \to \infty} f(x) = 0$$

H.A. $y = 0$

Ex

$$A(t) = 100(1.10)^t$$

$$A(1) = 110$$

$$A(2) = 121 = 100(1.10)(1.10)$$

$$A(3) = 100(1.10)(1.10)(1.10)$$

if t is in years.

is compounding annually

ex $100 to start at nominal rate of 10% compounded semiannually

$$A(t) = 100\left[\left(1+\frac{0.10}{2}\right)\left(1+\frac{0.10}{2}\right)\right]^{t}$$

$$= 100\left(1+\frac{0.10}{2}\right)^{2t}$$

$$A(1) = 110.25$$

ex $100. Nominal interest of 10%

compounded monthly (like a mortgage)

$$A(t) = 100\left[\left(1+\frac{0.1}{12}\right)^{12}\right]^{t}$$

$$= 100\left(1+\frac{0.1}{12}\right)^{12t}$$

$A(1) = 110.47 \to$ APR is 10.47%

Generalize to compounding n times a year at a nominal rate of r.

$$\boxed{A(t) = A_0\left(1+\frac{r}{n}\right)^{nt}}$$

ex $10,000 at birth you earn a nominal of 9% compounded daily. at age 65 how much do you have.

$$A(t) = 10{,}000\left(1 + \frac{0.09}{365}\right)^{365t}$$

$$A(65) = 10{,}000\left(1 + \frac{0.09}{365}\right)^{365(65)} \approx 3.47 \times 10^{6}$$