Exponentials

$f(x) = a\,b^x$ starts at 35

$f(x) = 35(0.92)^x$ ↓ 8%

---

53 $f(x) = \frac{1}{150}(3)^x$

$f(20) = \frac{1}{150}\,3^{20} = \frac{1}{150} \cdot 3.487 \times 10^9$

$= 23 \times 10^6$ inches

$23 \times 10^6 \text{ inches} \times \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{\text{mi}}{5280 \text{ ft}}$

$\approx$ 367 miles

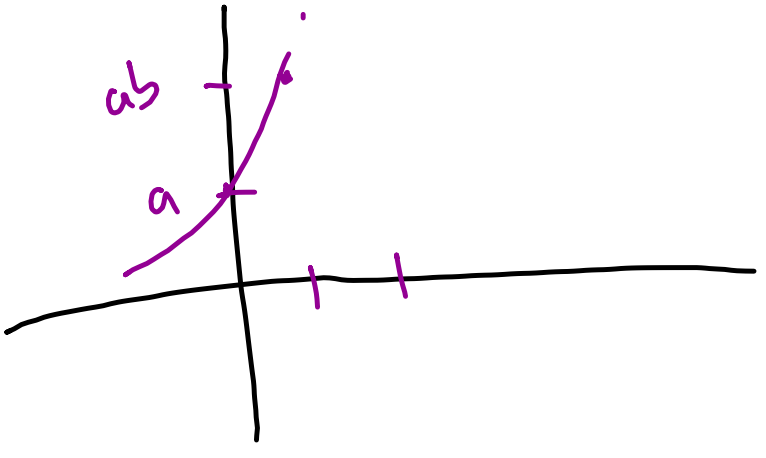
More on Exponentials

linear – as you change x by 1

$b, b+m, b+2m, b+3m$

exponential start at $(x=0, y=a)$ and let x increase by 1

$a, ab, ab^2, ab^3, ab^4, \ldots$



Ex at $t=0$ we are tracking pop. of turtles.

$t=4$ $P=300$

and 3 years later $P=450$

$$\frac{\Delta P}{\Delta t} = \frac{150}{3} = 50 = \frac{P-300}{t-4}$$

$$50(t-4) = P-300$$

$$50(t-4)+300 = P$$

$$50t-200+300 = P(t)$$

$$50t+100 = P(t)$$

---

exponentially $P = ab^t$

$$\frac{450}{300} = \frac{ab^7}{ab^4}$$

$$\frac{3}{2} = \frac{9}{6} = b^3$$

$$\sqrt[3]{\frac{3}{2}} = b$$

$$\left(\frac{3}{2}\right)^{\frac{1}{3}} = b$$

$$300 = ab^4$$

$$450 = ab^7$$