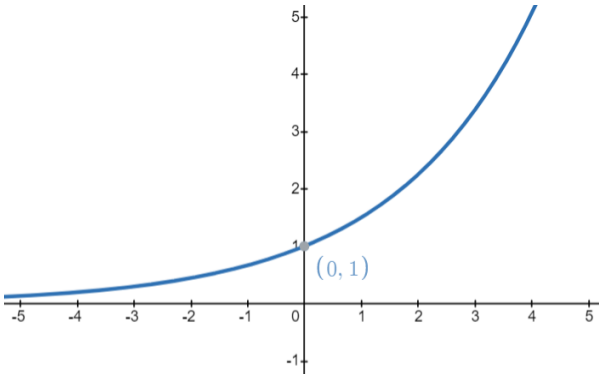
Basic Exponential Function

$f(x)=c^x$

Remember: x is called the *power* or the *exponent*,
c is the *base*.

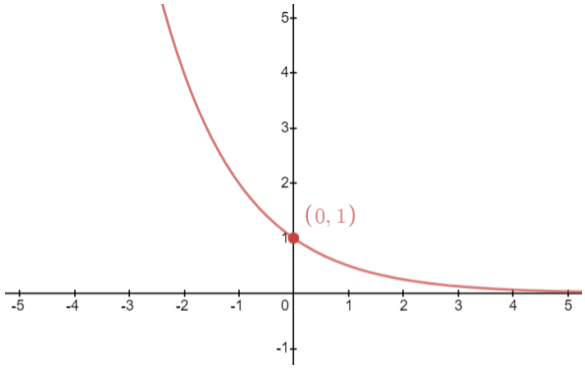
If c>1: f(x) is **increasing**

- Population growth
- Investment growth
- Bacteria growth
- Credit card interest



If 0<c<1: f(x) is **decreasing**

- Population decrease
- Investment loss
- Radioactive decay
- Depreciation of a car/machine



Solving exponential equations

Looking for f(x): Replace x

Ex1. $f(x)=2(3)^{2x}$. Find f(2). $y=?, x=2$

$f(2)=2(3)^{2(2)}=2(3)^4=162$

Ex2. $f(x)=40(0.85)^x$. Find f(4).

$f(4)=40(0.85)^4=20.88025=20.88$

Looking for x given f(x): Trial and error (at least 2 attempts)

Ex1. $f(x)=(5)^x$. If f(x)=3125, what is *x*?

$f(1)=5^1=5$ | $f(7)=5^7=78125$ | $f(6)=5^6=15625$ | $f(5)=5^5=3125$ ✓

$x=5$

Ex2. $f(x)=2(3)^x$. If f(x)=486, what is x?

$f(6)=2(3)^6=1458$ | $f(3)=2(3)^3=54$ | $f(5)=2(3)^5=486$ ✓

$x=5$

Ex. 3: $f(x)=3(7)^x$. If f(x)=1029, what is x?

$f(2)=3(7)^2=147$ | $f(3)=3(7)^3=1029$ ✓

$x=3$