Ex: A wolf population is growing exponentially.
In 2011, 129 wolves were counted.
In 2013, the population has reached 236 wolves.
(1) What are the 2 data points that can be used to derive the exp. function that models this situation?
(2) Find exp. function.

(1) 2 Data points: $(0, 129)$; $(2, 236)$.

(2) $\boxed{f(x) = 129 \cdot (1.35)^x}$

$a = 129$

$129 \cdot b^2 = 236$

$b^2 = \frac{236}{129}$; $b = 1.35$

Nov 8-10:39 AM

Compound - Interest Formula

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

P: the starting (initial) amount in the account. (P is called the principal)

r: annual interest rate

n: # of compounding periods per year. (monthly: $n = 12$; quarterly: $n = 4$; semiannually: $n = 2$)

$A(t)$: the value of the account after t years

t: measured in years.

Nov 8-11:02 AM

E.g. An initial investment of \$100,000 at 12% interest is compounded weekly. What will the investment be worth in 30 years.

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

$P = \$100,000$

$r = 0.12$

$n = 52$

$$A(30) = 100000 \cdot \left(1 + \frac{0.12}{52}\right)^{52 \cdot 30} \approx \$3.644 \times 10^6$$

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Constant e.
e is a constant, $e \approx \boxed{2.718282}$

Continuous Compound Interest Formula:

$$\boxed{A(t) = P \cdot e^{rt}}$$

If $P = 100,000$; $r = 0.12$

$$A(30) = 100000 \cdot (2.718282)^{0.12 \times 30} \approx 3.6598 \times 10^6$$

Nov 8-11:14 AM

Write an exponential function $y = ab^x$ for a graph that passes through $(2, 1)$ and $(3, 6)$.

Tutorial

$\boxed{ab^2 = 1} \rightarrow \boxed{a = \frac{1}{b^2}}$

$ab^3 = 6$

$\frac{1}{b^2} \cdot b^3 = 6$

$b = 6$; $a = \frac{1}{36}$

$\boxed{y = \frac{1}{36} \cdot (6)^x}$

–/1 points OSColAlg1 6.1.018. **0/6 Submissions Used**

$y = 4 \cdot \left(\frac{1}{2}\right)^x$; $f(x) = 4 \cdot \left(\frac{1}{2}\right)^x$; $f(-4) = 4 \cdot \left(\frac{1}{2}\right)^{-4} = 64$

1/1 points | Previous Answers OSColAlg1 6.1.044-050a.WA.Tut. **1/6 Submissions Used**

The graph of an exponential function of the form $f(x) = ab^x$ passes through $(1, 2)$ and $(2, 1)$

$f(-4) = 64$ ✔ Tutorial

$ab^1 = 2 \rightarrow \boxed{a = \frac{2}{b}}$

$ab^2 = 1$ — $\frac{2}{\cancel{b}} \cdot b^{\cancel{2}} = 1$

$2b = 1$; $b = \frac{1}{2}$, $a = 4$

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