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Week 6: Exponential and Logistic Function Models &gt; Lecture Videos &gt; Exponential Growth and Decay



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## Exponential Growth and Decay



Modeling is great.

It first allows us to first makes sense of a relationship between two

numerical variables in a more hands on way,

and then, second, allows us to share what we've found in a succinct form



0:00 / 0:00

▶ 1.0x



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## Comprehension Check


1. What is the growth factor in each of the following scenarios? *(Assume time is measured in the units given; round answers to 2 decimal places.)*

## Function Models

### Readings


Reading Check due  
Mar 15, 2016 at 18:00  
UTC 

### Lecture Videos

Comprehension Check  
due Mar 15, 2016 at  
18:00 UTC 

### R Tutorial Videos


### Pre-Lab

Pre-Lab due Mar 15,  
2016 at 18:00 UTC 

### Lab

Lab due Mar 15, 2016  
at 18:00 UTC 

### Problem Set

Problem Set due Mar  
15, 2016 at 18:00 UTC 

1a. Water usage is increasing by 3% per year. (Round answers to 2 decimal places.)



1b. A city grows by 28% per decade. (Round answers to 2 decimal places.)



1c. A diamond mine is depleted by 1% per day. (Round answers to 2 decimal places.)



1d. A forest shrinks 80% per century. (Round answers to 2 decimal places.)



2. The amount (in milligrams) of a drug in the body  $t$  hours after taking a pill is given by:

$$A(t) = 25(0.85)^t$$

2a. What is the initial dose given (in milligrams)?



2b. What percent of the drug leaves the body each hour? (*Report without the % sign.*)



2c. What is the amount of the drug left after 10 hours? (*Round to 2 decimal places; report in milligrams.*)



3. If the population grows by 10 people per year, what is the formula for the population,  $P$ , at time  $t$ ?

(1/1 point)

☒  $P(t) = 100 + 10t$

☐  $P(t) = 100t^{10}$

☐  $P(t) = 100(1.10)^t$

☐  $P(t) = 100 + 1.10t$

4. If the population grows by 10% each year, what is the formula for the population,  $P$ , at time  $t$ ?

(1/1 point)

☐  $P(t) = 100 + 10t$

☐  $P(t) = 100t^{10}$

☒  $P(t) = 100(1.10)^t$  ✓

☐  $P(t) = 100 + 1.10t$

5. Which scenario will result in a larger population in 10 years?

a. 10% growth per year

b. an increase of 10 people per year

(1/1 point)

☒ 10% growth ✓

☐ 10 people per year

☐ 10% growth will outpace the 10 people per year, but then 10 people per year will grow faster.

☐ They will be the same.

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