# Writing Exponential Expressions in Equivalent Forms

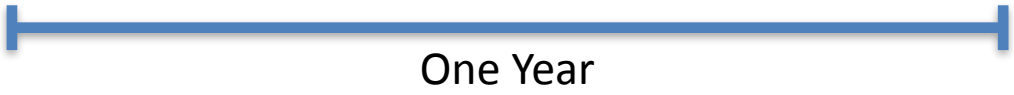
# By the end of this lesson, I will be able to answer the following questions…

1. How do I find percentages of given amounts?

2. Given a scenario, how do I produce an exponential function and use it to make predictions?

# Vocabulary

1. Annually




2. Quarterly


3. Monthly

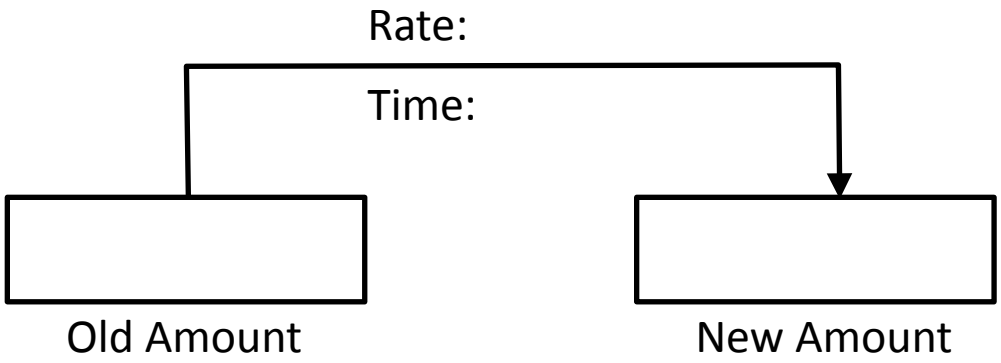
# Prerequisite Skills with Practice

Suppose you receive a RAISE in your paycheck of 12%. Your NEW paycheck after the raise is $540. What was the amount of your OLD paycheck (BEFORE the raise.)

$$\frac{new}{old} = \frac{1+r}{1}$$

Suppose you receive a DECREASE in your paycheck of 34%. Your NEW paycheck after the decrease is $1024 What was the amount of your OLD paycheck (BEFORE the decrease.)

**A city's population has increased 40% during the last 5 years and is now 448,000 people.**




**What was the population 5 years ago?**

**Assuming that the population increased at the same rate each year, what was the annual rate of increase?**

Yearly Rate: The rate mentioned in the scenario shows a 44% increase over 5 years. We want to find the % increase over ONE year.

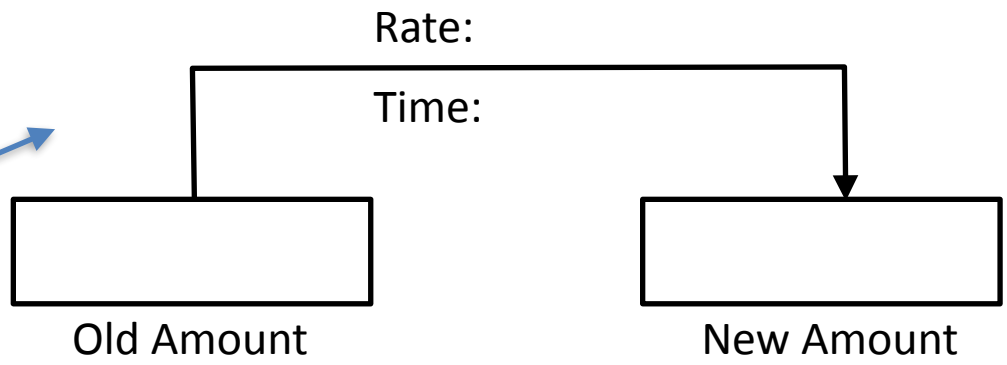
$$(1+r)^t \rightarrow$$

**Write an equation that models the scenario above a yearly increase.**

$$y = a(1+r)^t$$

**A financial magazine had 57,500 subscribers on January 1, 2010, which represented an increase of 243% in the 10 years since January 1, 2000.**

**<u>Assuming that the number of subscribers increased at the same rate each year, how many subscribers did the magazine have on January 1, 2004?</u>**




Yearly Rate: The rate mentioned in the scenario shows a 243% increase over 10 years. We want to find the % increase over ONE year.

$(1+r)^t \rightarrow$

Build the equation

$y = a(1+r)^t$

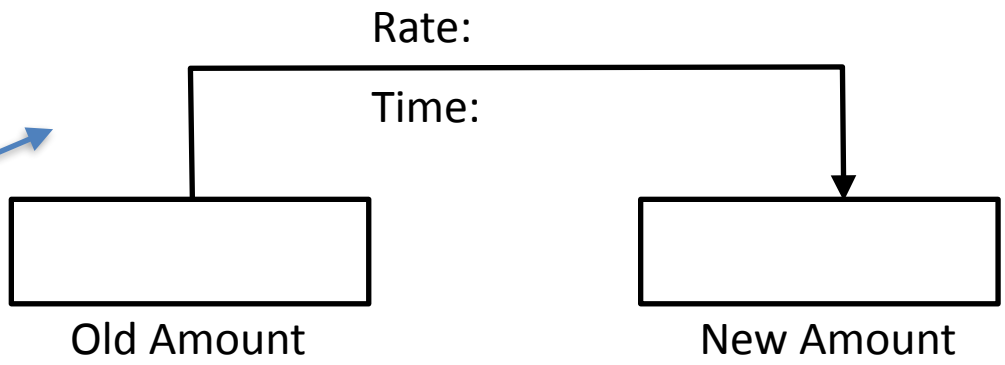
Use it to answer the problem

**Sajeena paid $20,000 for a new car in April 2004. The car was worth $6,000 in April 2012.**

**Assuming a constant annual rate of decrease in value, what was the annual rate of decrease?**

**What was the value of the car in April 2009?**

**What is the predicted value of the car for April 2018?**




Yearly Rate: The rate mentioned in the scenario shows a _____% decrease over 8 years. We want to find the % increase over ONE year.

$(1+r)^t \rightarrow$

Build the equation

$y = a(1+r)^t$

Use it to answer the problem

# THE END

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