

# Exponential Modeling

## College Algebra

### Main Ideas

- Test if data can be modeled by an exponential function by dividing consecutive values of the dependent variable.
- The strategy for finding an exponential model is similar for finding a linear model. Only the algebraic operations change.
- Once you have the model, the followup questions are repetitive.

### Testing if Data is Exponential

#### How To – Test if Data is Exponential

Starting with a table of values where the change in the independent variables is constant:

1. Divide consecutive values of the dependent variable.
2. If the quotients are all the same, then the data can be modeled by an exponential function.

### Finding an Exponential Model from Data

#### How To – Find an Exponential Model from Data

To find an exponential function  $f(x) = P \cdot a^x$  starting with a table of values that can be modeled by an exponential function:

1. Note the change in the independent variable. Call that change  $h$ .
2. Divide consecutive values of the dependent variable. This quotient is  $a^h$ .
3. Raise  $a^h$  to the  $\frac{1}{h}$  power. That value is  $a$ .
4. Substitute the value of  $a$  and a matching pair of  $x$  and  $f(x)$  from the table to solve for  $P$ .