

Which formula would you use? Choose from *Exponential Growth*, *Exponential Decay*, *Compound Interest* or *Half-Life*. Then solve the problem. Remember to show all work.

1. Annual sales for a fast food restaurant are \$650,000 and are increasing at a rate of 4% per year; 5 years.
2. The value of a company's equipment is \$25,000 and decreases at a rate of 15% per year; 8 years.
3. The half-life of Iodine-131 is approximately 8 days. Find the amount of Iodine-131 left from a 35 gram sample after 32 days.
4. \$65,000 invested at a rate of 6% compounded quarterly; 12 years.
5. \$95,000 invested at a rate of 4.25% compounded monthly; 10 years.
6. The population of Indiana showed an annual growth rate of 0.6% between 2006 and 2007. The population in 2007 was approximately 286,000,000. Based on this model, find the population in 2014.

7. A population of 2300 manatees in Florida is thought to be decreasing at a rate of 1.1% annually; 7 years.
8. The half-life of Cobalt-60 is approximately 5.25 days. Find the amount of Cobalt-60 left from a 30 gram sample after 42 days. Round to the nearest thousandth of a gram.

Identify each of the following functions as exponential growth or decay. Then give the rate of growth or decay as a percent.

Exponential Growth $y = a(1 + r)^t$ Exponential Decay $y = a(1 - r)^t$

1. $y = 4(1.73)^t$

2. $y = a(0.95)^t$

3. $y = 2\left(\frac{3}{4}\right)^t$

4. $y = a\left(\frac{4}{3}\right)^t$