More Exponent Problems 30

Example: It is found that the population of a colony of insects doubles every 20 days. The initial population is 150.

Find the population after 20 days.

Find the population after 60 days.

Find an equation relating the population P to the number of days d.

Answers: 300, 1200, $P = 150x(2)^{d/20}$.

1) The current inflation rate is 3.5%. Estimate the cost of a liter of gasoline 5 years from now, if the current cost is $0.89.

2) The current population of a country is 45.0 million. The population growth rate is 2% per year. Estimate the population in ten years.

3) A new car is worth $25,000. The value depreciates at a rate of 18% per year.

a) Find the value of the car after one year.

b) Find the value of the car after three years.

4) It is found that a population of bacteria triples (x3) every hour. The initial population of bacteria is 500.

a) Find the population at the end of 6 hours.

b) Write an equation which shows the population (P) at a time (t) in hours.

5) The amount of a radioactive isotope (iodine-131) decreases by half (50%) every 8 days. The initial amount of the isotope is 64 g.

a) Find the amount left after 8 days.

b) Find the amount left after 16 days.

c) Find the amount left after 32 days.

d) Write an equation which shows the amount (A) of isotope left after (t) days.

Answers: 1) \$1.06, 2) 54.9 million, 3)a) \$20,500, b) \$13,784.20, 4)a) 364,500, b) $P = 500(3)^t$, 5)a) 32g, b) 16g, c) 4g, d) $A = 64(0.5)^{t/8}$.