The number of cases of flu is increasing 22% every 4 days. On February 1 there were 176 cases of flu.

$100 + 22 = 122\%$

1.22

a. Find the number of cases 12 days later.

$y = 176(1.22)^{x=3}$ $\quad 12 \div 4 = 3$

≈ 320

b. Find the nmber of cases of flu 3 weeks later.

$y = 176(1.22)^{x=5.25}$ $\quad 21 \div 4 = 5.25$

≈ 500

The number of deer in the county has been decreasing 5.6% every 5 years. The number of deer in 2009 was 9,500.

a. Find the number of deer in 2014.

$y = 9500(.944)^{x=1}$

$= 8968$

b. Find the number of deer in 2020.

$y = 9500(.944)^{x=\frac{11}{5}}$

$= 8369$

s

Other exponential growth and decay situations:

The number of cells doubles every 5 hours.

- This represents the amount of time it takes for a quantity to double its amount.
- the base of the exponential equation is 2

The half-life of a radioactive material is two weeks.

- This represents the amount of time it takes for a quantity to reduce to half its amount.
- the base of the exponential equation is 0.5

The number of cells of bacteria doubles every 2 hours.

If there are 32 cells at midnight, how many cells with there be 2 days later?

2 days $= 48$ hrs

$\div 2$

24

$32(2)^{x=24}$

$= 536,870,912$

The number of cells of a certain bacteria doubles every 20 minutes.

a. At 6:00 am there were 150 cells. Model this situation with an exponential equation.

$y = 150(2)^x$

b. Find the number of cells at 1:00pm.

7 hrs $\times 60$ = 420 min $\div 20$ min = 21

$150(2)^{21}$

The half-life of a certain medicine 15 minutes. You took a 350 mg dose at 1:00 pm.

a. Model this situation with an exponential equation.

$y = 350(.5)^x$

b. Find the amount remaining at 3:00 pm.

1:00pm to 3:00pm = 2hrs

$350(.5)^8$ $x = 8$

1.37 mg

A company claims that if you invest $15,000 your money will double every 4 years.

$y = 15{,}000(2)^x$

a) How much will you have in 12 years?

$x = 12 \div 4 = 3 \rightarrow 120{,}000$

b) How much will you have in 22 years?

$x = 22 \div 4 = 5.5$ 67881 822.51

You can now finish Hwk #14

Practice Sheet Sec 8-8

Due Tomorrow

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Exponents:

V.4 multiplication rules
V.5 division rules
V.6 mult & div rules
V.7 power rule

Scientific Notation:

W.1 convert between SN and Std
W.3 Multiply #'s in SN
W.4 Divide #'s in SN

Exponential Growth and Decay:

X.3 Exponential growth and Decay story problems.