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Algebra II

## *Equivalent Exponents Forms*

**Express each of the following functions with an exponent of  $t$ . Round values to the nearest thousandth.**

1.  $A = 12,000(1.025)^{12t}$

2.  $A = 25,000(1.125)^{13.2t}$

3.  $A = 37,000(.986)^{10t}$

4.  $A = 17,000(.889)^{9.4t}$

5.  $A = 9,175(1.885)^{\frac{1}{2}t}$

6.  $A = 9,325(1.762)^{\frac{2}{5}t}$

7.  $A = 11,185(.764)^{\frac{t}{12}}$

8.  $A = 125,000(.785)^{\frac{t}{4}}$

9. Iridium-192 is an isotope of iridium and has a half-life of 73.83 days. If a laboratory experiment begins with 100 grams of Iridium-192, the number of grams,  $A$ , of Iridium-192

present after  $t$  days would be  $A = 100\left(\frac{1}{2}\right)^{\frac{t}{73.83}}$ . Which equation approximates the amount of

Iridium-192 present after  $t$  days?

1)  $A = 100\left(\frac{73.83}{2}\right)^t$

3)  $A = 100(0.990656)^t$

2)  $A = 100\left(\frac{1}{147.66}\right)^t$

4)  $A = 100(0.116381)^t$

10. The population,  $p(t)$ , of a small county in Western New York has grown according to the formula  $p(t) = 6000(1.392)^{1.2t}$  after  $t$  years. When re-written in the form  $p(t) = 6000e^{rt}$ , what is the value of  $r$  rounded to the nearest thousandth?

11. The value of an investment account,  $v(t)$ , can be modeled by the formula  $v(t) = 10000(.875)^{1.04t}$  after  $t$  years. When written in its equivalent form,  $v(t) = 10000e^{rt}$ , what would be the value of  $r$  rounded to the nearest tenth of a percent? Interpret the meaning of this value in the context of the problem.

12. The half-life of iodine-131 is 8 days. The percent of the isotope left in the body  $d$  days after being introduced is  $I = 100\left(\frac{1}{2}\right)^{\frac{d}{8}}$ . When this equation is written in terms of the number  $e$ , the base of the natural logarithm, it is equivalent to  $I = 100e^{kd}$ . What is the approximate value of the constant,  $k$ ?

- |             |              |
|-------------|--------------|
| 1) $-0.087$ | 3) $-11.542$ |
| 2) $0.087$  | 4) $11.542$  |

13. According to a pricing website, Indroid phones lose 58% of their cash value over 1.5 years. Which expression can be used to estimate the value of a \$300 Indroid phone in 1.5 years?

- 1)  $300e^{-0.87}$
- 2)  $300e^{-0.63}$
- 3)  $300e^{-0.58}$
- 4)  $300e^{-0.42}$