$A = \text{initial}(1 \pm r)^{\text{time}}$

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Algebra II

Interpreting Exponential Functions

1. The function $A = 3,600(1.025)^t$ represents the value of a bank account after t years. Which of the following statements is *false*?
1) The initial investment of the bank account was \$3,600. ✓
2) The annual interest rate of the bank account is 2.5%. ~~1.02~~ $1.025-1=.025(100)=2.5\%$ ✓
3) The value of the account after 5 years is \$4073.07. $3,600(1.025)^5 = 4073.07$ ✓
4) It will take 12 years for the value of the account to double. $3600(1.025)^{12} = 4841.60$ Didn't double ✗

2. The function $v(t) = 10,000(1.112)^t$ represents the value of a stock investment after t years. Which of the following statements is *false*?
1) The stock is increasing by 11.2% each year. $1.112-1=.112(100)=11.2\%$ ✓
2) The value of the stock after 3 years is \$13,750.37 $10,000(1.112)^3 = 13,750.37$ ✓
3) The value of the stock increased by \$1245.44 between year 1 and year 2. $10,000(1.112)^1 = 11120$
$10,000(1.112)^2 = 12365.44$
$12365.44 - 11120 = 1245.44$ ✓
4) The initial stock investment was \$11,120. ✗
10,000 was initial investment

3. The function $v(t) = 40,000(0.887)^t$ represents the value of a 2020 Subaru Ascent after t years. Which of the following statements is *false*?
1) The initial value of the car was \$40,000. ✓
2) The value of the car is decreasing by 11.3% each year. $1-.887=(.113)100=11.3\%$ ✓
3) The car is worth \$15,324.18 after 5 years. $40,000(.887)^5 = 21962.31$ ✗
4) The decreased \$3,556.20 from years 2 to 3. $40,000(.887)^2 = 31470.76$
$40,000(.887)^3 = 27914.56$
$31470.76 - 27914.56 = 3556.20$ ✓

must first get just t in exponent

4. A certain pain reliever is taken in 220 mg dosages and has a half-life of 12 hours. The function $A = 220\left(\frac{1}{2}\right)^{\frac{1t}{12}}$ can be used to model this situation, where A is the amount of pain reliever in milligrams remaining in the body after t hours. According to this function, which statement is true?

$A=220\left(\frac{1}{2}^{\frac{1}{12}}\right)^{t}$ $A=220(.94387..)^{t}$

1) Every hour, the amount of pain reliever remaining is cut in half. ✗ decreases by ≈6%.
2) In 12 hours, there is no pain reliever remaining in the body. ✗ there will never be 0.
3) In 24 hours, there is no pain reliever remaining in the body. ✗ there will never be 0.
4) In 12 hours, 110 mg of pain reliever is remaining. ✓

$A=220(.94387..)^{t}$ $A=220(.94387..)^{12}$ $A=110$

5. An equation to represent the value of a car after t months of ownership is $v = 32,000(0.81)^{\frac{1t}{12}}$. Which statement is *not* correct?

$V=32{,}000(.81^{\frac{1}{12}})^{t}$ $V=32{,}000(.98259..)^{t}$

1) The car lost approximately 19% of its value each month. ✗ ≈2%.
2) The car maintained approximately 98% of its value each month. ✓
3) The value of the car when it was purchased was $32,000. ✓
4) The value of the car 1 year after it was purchased was $25,920. $32{,}000(.98259..)^{12}=\$25920$ ✓

6. The value of an investment account, $v(t)$, can be modeled by the equation $v(t) = 500(1.15)^{3.2t}$ after t years. Which of the following statements must be true?

$V(t)=500(1.15^{3.2})^{t}$ $V(t)=500(1.56..)^{t}$

1) The account is increasing approximately 15% each year. ✗
2) The account is increasing approximately 56% each year ✓
3) There will be $1216.80 in the account after two years $500(1.56..)^{2}=1223..$ ✗
4) It will take 3.68 years for the account to double $500(1.56..)^{3.68}=2592..$ much more than doubled ✓