

Model exponential growth and decay

1

What is the starting debt in this equation for a growth in credit card debt with quarterly interest?

$$1,034 = 700 \cdot (1 + 0.05)^{(8)}$$

A $D_0 = 5$

B $D_0 = 700$

C $D_0 = 8$

2

What is the time in this equation for a decline of a toxin concentration (hourly dialysis)?

$$172 = 300 \cdot (1 - 0.06)^{(9)}$$

A $t = 171$

B $t = 9$

3

What does this term represent in a model of continuously compounding growth of a share price?

$$S = S_0 \cdot e^{(r \cdot t)}$$
$$S = ?$$

A $S = \text{final price}$

B $S = \text{rate}$

C $S = \text{starting price}$

D $S = \text{time}$

4

Which scenario describes this equation?

$$602 = 700 \cdot e^{(-0.05 \cdot 3)}$$

A A radioactive material starts at an isotope concentration of 300ppm. It decays continuously at 5% per day. After 7 days it has decayed to an isotope concentration of 602ppm.

B A radioactive material starts at an isotope concentration of 700ppm. It decays continuously at 5% per day. After 3 days it has decayed to an isotope concentration of 602ppm.

5

What is the final views in this equation for a continuous exponential growth of social media post views?

$$743 = 700 \cdot e^{(0.03 \cdot 2)}$$

A $V = 3$

B $V = 700$

C $V = 743$

6

What is the value of the final population given this model of a growth of a rabbit population (yearly breeding cycle)?

$$P = 200 \cdot (1 + 0.05)^{(4)}$$

A $P = 215$

B $P = 280$

C $P = 285$

D $P = 243$

7

What is the value of the final concentration given this model of a continuous decay of a radioactive material?

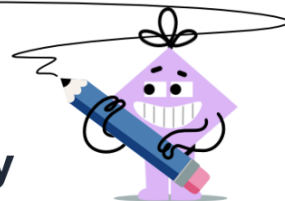
$$R = 600 \cdot e^{(-0.02 \cdot 9)}$$

A $R = 385$

B $R = 501$

C $R = 520$

D $R = 330$



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8

What is the value of the final views given this model of a continuous exponential growth of social media post views?

$$V = 700 \cdot e^{(0.04 \cdot 9)}$$

A	$V = 880$
B	$V = 1,500$
C	$V = 1,003$
D	$V = 1,360$

9

What is the value of the final debt given this model of a growth in credit card debt with quarterly interest?

$$D = 700 \cdot (1 + 0.06)^{\left(\frac{24}{3}\right)}$$

A	$D = 920$
B	$D = 1,115$
C	$D = 1,290$
D	$D = 1,220$

10

What is the value of the final population given this model of a continuous growth of a bacteria population?

$$P = 500 \cdot e^{(0.08 \cdot \frac{9}{7})}$$

A	$P = 554$
B	$P = 445$
C	$P = 640$
D	$P = 490$

11

A savings account starts with \$400. Each subsequent year it earns 6% in interest. After 2 years it has a certain amount of cash.

A	$P = 345$
B	$P = 449$
C	$P = 300$
D	$P = 370$

12

An insect population starts at 400. Each subsequent yearly breeding season it grows by 7%. After 5 years it has increased to a population of 561.

A	$561 = 700 \cdot (1 + 0.04)^{(5)}$
B	$561 = 400 \cdot (1 + 0.07)^{(5)}$
C	$561 = 500 \cdot (1 + 0.07)^{(4)}$
D	$561 = 400 \cdot (1 + 0.05)^{(7)}$