



Exponential Function Solution Equation - Growth (Discrete, Mis-matched Time Units) Scenario to Time

1

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$500 of debt. Each subsequent quarter it grows by 4% in interest. After a certain number of years the debt has grown to \$684.

$$A \quad t = 4 \cdot \frac{\ln \frac{684}{500}}{\ln(1 - 0.04)} \quad B \quad t = \frac{1}{4} \cdot \frac{\ln 684 \cdot 500}{\ln(1 + 0.04)}$$

$$C \quad t = \frac{1}{4} \cdot \frac{\ln \frac{684}{500}}{\ln(1 + 0.04)}$$

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$300 of debt. Each subsequent quarter it grows by 6% in interest. After a certain number of years the debt has grown to \$478.

$$A \quad t = \frac{1}{4} \cdot \frac{\ln \frac{478}{300}}{\ln(1 + 0.06)} \quad B \quad t = 4 \cdot \frac{\ln \frac{478}{300}}{\ln(1 - 0.06)}$$

$$C \quad t = \frac{1}{4} \cdot \frac{\ln 478 \cdot 300}{\ln(1 + 0.06)}$$

3

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$500 of debt. Each subsequent month it grows by 8% in interest. After a certain number of quarters the debt has grown to \$999.

$$A \quad t = 3 \cdot \frac{\ln \frac{999}{500}}{\ln(1 - 0.08)} \quad B \quad t = \frac{1}{3} \cdot \frac{\ln \frac{999}{500}}{\ln(1 + 0.08)}$$

4

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$800 of debt. Each subsequent month it grows by 4% in interest. After a certain number of years the debt has grown to \$21,572.

$$A \quad t = 12 \cdot \frac{\ln \frac{21572}{800}}{\ln(1 + 0.04)} \quad B \quad t = \frac{1}{12} \cdot \frac{\ln \frac{21572}{800}}{\ln(1 + 0.04)}$$

$$C \quad t = \frac{1}{12} \cdot \frac{\ln 21572 \cdot 800}{\ln(1 + 0.04)}$$

5

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$400 of debt. Each subsequent year it grows by 2% in interest. After a certain number of quarters the debt has grown to \$459.

$$A \quad t = \frac{1}{4} \cdot \frac{\ln \frac{459}{400}}{\ln(1 + 0.02)} \quad B \quad t = 4 \cdot \frac{\ln \frac{459}{400}}{\ln(1 + 0.02)}$$

$$C \quad t = \frac{1}{4} \cdot \frac{\ln \frac{459}{400}}{\ln(1 - 0.02)}$$

Rearrange the exponential equation to solve for for the time given this scenario?

A savings account starts with \$500. Each subsequent quarter it earns 7% in interest. After a certain number of months it has \$919.

$$A \quad t = 3 \cdot \frac{\ln \frac{919}{500}}{\ln(1 + 0.07)} \quad B \quad t = \frac{1}{3} \cdot \frac{\ln \frac{919}{500}}{\ln(1 + 0.07)}$$

$$C \quad t = \frac{1}{3} \cdot \frac{\ln \frac{919}{500}}{\ln(1 - 0.07)}$$

7

Rearrange the exponential equation to solve for for the time given this scenario?

A credit card starts with \$800 of debt. Each subsequent year it grows by 9% in interest. After a certain number of quarters the debt has grown to \$950.

$$A \quad t = 4 \cdot \frac{\ln \frac{950}{800}}{\ln(1 + 0.09)} \quad B \quad t = \frac{1}{4} \cdot \frac{\ln \frac{950}{800}}{\ln(1 + 0.09)}$$

8

Rearrange the exponential equation to solve for for the time given this scenario?

A savings account starts with \$200. Each subsequent month it earns 6% in interest. After a certain number of quarters it has \$402.

$$A \quad t = \frac{1}{3} \cdot \frac{\ln 402 \cdot 200}{\ln(1 + 0.06)} \quad B \quad t = 3 \cdot \frac{\ln \frac{402}{200}}{\ln(1 + 0.06)}$$

$$C \quad t = \frac{1}{3} \cdot \frac{\ln \frac{402}{200}}{\ln(1 + 0.06)}$$