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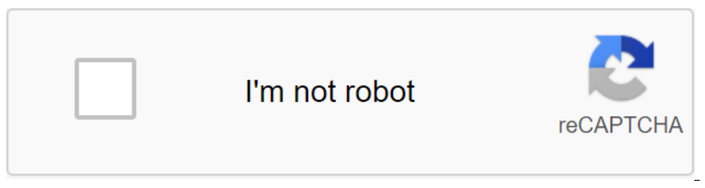

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In this section we will see how to solve the problems of words on exponential growth and decay. Before you look at the problems, if you want to learn about exponential growth and decay, please click hereProblem 1 :D Avid owns a chain of fast food restaurants that operated 200 stores in 1999. If the growth rate is 8% per year, how many restaurant shops are running in 2007? Solution : The number of years between 1999 and 2007 is n No 2007 - 1999n - 8No. stores in 2007 - P (1'r)ⁿSubstitute P 200, r 8% or 0.08 and n 8.No stores in 2007 - 200 (1 - 0.08)8No stores in 2007 - 200 (1.08)8The stores in 2007 - 200 (1,8509)No. Stores in 2007 - 370.18 So, the number of stores in 2007 is about 370.Problem 2: You invest $2,500 in a bank that pays 10% interest per year is compounded continuously. What will be the value of the investment in 10 years? Solution : We should use the formula below to know the value of the investment after 3 years. A - PertSubstitute P - 2500r - 10% or 0.1t - 10e 2.71828Then, we have A 2500 (2.71828) (0.1)10A and 6795.70 So, the value of investment after 10 years is $6795.70.Problem 3 :Suppose the radio-active substance disintegrates at a rate of 3.5% per hour. What percentage of the substance will remain in 6 hours? Solution: Since the initial amount of the substance is not given and the problem is based on the percentage, we must assume that the initial amount of the substance is 100. We should use the formula below to find the percentage of the substance after 6 hours. A - P(1 - r)nSubstitute P - 100r - -3.5% or -0.035t - 6 (Here, the value of r is taken in a negative sign. because the substance disintegrates)A 100 (1-0.035)6A 100 (0.935)6A 100 (0.8075)A 80.75As while the amount of substance is assumed as 100, The percentage of the substance left after 6 hours is 80.75% Problem 4 : The number of bacteria in a certain culture doubles every hour. If there were 30 bacteria in the culture initially, how many bacteria would be present at the end of the 8th hour? Solution :Note that the amount of bacteria present in the culture doubles at the end of consecutive hours. Since it grows at a constant ratio of 2, growth is based on geometric progression. We have to use the formula below to find no. bacteria present at the end of the 8th hour. A - abxSubstitute a 30b - 2x - 8Then, we have A 30 (28)A 30 (256)A 7680 So, the amount of bacteria at the end of the 8th hour is 7680.Problem 5 : The amount of money placed on interest complex doubles itself in 3 years. If interest is compounded annually, in how many years will it quadruple itself? Solution :Let P be the amount invested initially. From this information, P becomes 2P in 3 investing in complex interests, for the 4th year, the main will be 2p. And 2P becomes 4P (it doubles itself) in the next 3 years. Thus, at the end of 6 years, the accumulated value will be 4P. Thus, the amount deposited will be 4 times in 6 years. Related topics :D Doubling the growth time of FormulaHalf-Life Decay FormulaApart from the material given in this section, if you need any other stuff in math, please use or Google custom search here. If you have any feedback on our math content, please give us: v4formath@gmail.com We always appreciate your feedback. You can also visit the following web pages on various things in math. 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Related: More For examples of math-level math examples, solutions, videos, activities and sheets that are suitable for math level to help students learn how to solve the exponential growth and decay problem of the word. The following chart shows the exponential formula for growth and decay. Scroll down for more examples and solutions that use an exponential growth and decay formula. Exponential Growth Feature - Population This video explains how to determine the exponential growth function from this information. He then explains how to determine when a particular population will be reached and when it will double. Show Step by Step Solutions Exponential Growth Feature - Bacterial Growth This video explains how to determine the exponential growth function from this information. He then explains how to determine when a particular population will be reached. Show Step by Step Solutions Exponential Decay : C4 Edexcel January 2013 No 8 Bottle of Water is put in the refrigerator. The temperature inside the refrigerator remains constant at 3 degrees Celsius, and a few minutes after the bottle is placed in the refrigerator, the temperature of the water in the bottle θ degrees Celsius. The rate of change in the temperature of the water in the bottle is modeled by the differential equation dθ/dt q (3-θ)/125 (a) By solving the differential equation, show that the θ and e-0.008t No. 3, where A is a constant. Given that the temperature of the water in the bottle when it was placed in the refrigerator was 16 degrees Celsius, (b) find the time it takes for the temperature of the water in the bottle to drop to 10 degrees Celsius, giving its answer to the nearest moment show step by step Solutions Exponential Growth / Problem of Population Growth In this video, we know that the population is growing exponentially; we also know that there were 200 bacteria 3 days ago and 1000 bacteria yesterday. How many bacteria will be present tomorrow? Show Step by Step Solutions Connection Interest - Exponential Growth Show Show Step-by-Step Solutions Try free Mathway Calculator and Problem Solving below to practice different math topics. Try these examples or deal with your own problems and check your answer with a step-by-step explanation. We welcome your feedback, comments and questions about this site or page. Please send your feedback or requests through our feedback page. The exponential growth and decay of Word Problem - Displaying the top 8 sheets found for this concept. Some of the sheets for this concept are exponential growth and word decay problems, exponential growth and disintegration, exponential growth and work decay, Exp growth decay word probs, growth of word decay key, college algebra work 2 exponential growth and decay, Word problems of growthdecay and half The exponential problems of the word. Found the sheet you're looking for? To download/print, click on a pop-up icon or a print icon on a print or download sheet. The worksheet will open in Window. You can download or print using browser document readers. Exponential growth/disintegration is a specific way that the number can increase/decrease over time. To solve the problems of exponential growth and decay, we need to be aware of exponential growth and decay functions. Let's look at the following two examples. When we invest money in the bank, it grows year after year, because of the interest paid by the bank. We buy a car and use it for several years. When it gets too old, we'd like to sell it. In the first example we will be interested in knowing the final value (the amount invested and interest) of our deposit. To find out the final value of the deposit, we must use the growth function. In the second example, we will seek to find out the selling value of the car (purchased price - depreciation). Here we have to use the decay function. Thus, growth and decay functions are used in our lives. Formula Many real phenomena are being modeled by features that describe how things grow or disintegrate over time. Let's look at the formulas that are used to evaluate both growth and decay. Formula 1 : The formula below is linked to the complex interest formula and is a case where interest is constantly increasing. That is, at any moment the balance changes at a rate equal to the r of the current balance. We use this formula when it is given exponential growth/or decay. A - PertA ---/ Ending --- --- ---. Formula 2 : The formula below is a formula of complex interests and is a case where interest is compounded annually or growth is exacerbated after the end of the term. A - P(1 r)nA ---.s ending ---. the amount of ---/growth n ---/TimeNote : If it's a breakup function, the r value will be negative. Formula 3 : The formula below is associated with geometric progression. Here the initial amount will grow/decompose with a constant ratio of b. A AbxA ---; The end of the ---; the beginning of the amount of ---/break-up ratio x ---/no. years / termsNote : If it's a growth feature, we'll have a r'gt; 1If it's a breakup feature, we'll have a 0 zlt; 1 problem practice problems 1:Mark invests $1500 at the rate of 6% per cent. How much does an investment cost after 5 years? Solution : Formula Complex interest : A p(1 - r)nSubstitute P - 1500r - 6% or 0.06n, 5Then, A 1500 (1 - 0.06)5A - 1500 (1.06)5Uza calculator. A 2,007.34 So, the value of an investment after 5 years is about $2,007.34Problema 2 : The price of a new car is $28,000. If the cost of a car decreases by 12% per year, what will be the price In five years? Solution Solution Break-up formula :A - P (1 - r)nSubstituteP - 28000r - 12% or 0.12n - 5Then, A 2800 (1 - 0.12)5A - 1500 (0.88)5Uza calculator. A 14,776.49 So, the price of the car will be about $14,776.49Problem 3 : Investments worth $2,500 made by a bank that pays 10% interest per year is compounded continuously. What will be the value of the investment in 10 years? Solution : We should use the formula below to know the value of the investment after 3 years. A - PertSubstitute P - 2500r - 10% or 0.1t - 10e 2.71828Then, A 2500 (2.71828) (0.1)10A and 6795.70 So, the value of an investment after 10 years is $6,795.70.Problem 4 : The number of bacteria in a certain culture doubles every hour. If there were 30 bacteria in the culture initially, how many bacteria would be present at the end of the 8th hour? Solution :Note that the amount of bacteria present in the culture doubles at the end of consecutive hours. Since it grows at a constant ratio of 2, growth is based on geometric progression. We have to use the formula below to find no. bacteria present at the end of the 8th hour. A - abxSubstitute a 30b - 2x - 8Then, we have A 30 (28)A 30 (256)A 7680 So, the number of bacteria at the end of the 8th hour is 7680. Related Topics: Doubling the growth time of FormulaHalf-Life Decay FormulaApart from the material given in this section, if you need any other stuff in math, please use or Google custom search here. If you have any feedback on our math content, please give us: v4formath@gmail.com We always appreciate your feedback. You can also visit the following web pages on various things in math. 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