

Continue



A cable company with a reputation for poor customer service is losing subscribers at a rate of approximately 3% per year. The company had 2 million subscribers at the start of 2014.

Assume that the company continues to lose subscribers at the same rate, and that there are no new subscribers. Which of the following functions,  $S$ , models the number of subscribers (in millions) remaining  $t$  years after the start of 2014?

- $S(t) = 2(1.03)^t$        $S(0) = 2$
- $S(t) = 2(0.97)^t$        $S(1) = 2(0.97)$
- $S(t) = 2(0.70)^t$        $S(2) = 2(0.97)(0.97)$
- $S(t) = 2(0.97)^t$        $S(3) = 2(0.97)$
- $S(t) = 2(0.97)t$

# E3

Name: ANSWERS Date: \_\_\_\_\_  
Mr. Art Period: \_\_\_\_\_

## Exponential Functions Exponential Growth & Decay Word Problems

1) In 2000 Florida's population was 16 million. Since 2000, the state's population has grown about 2% each year. This means that Florida's population is growing exponentially. Find Florida's population in 2006?

$y = a(1+r)^x$   
Starting amt.   growth   time in years

$a = 16,000,000$   
 $r = 2\% = 0.02$   
 $x = 2006 - 2000 = 6 \text{ years}$

$y = a(1+r)^x$   
 $y = 16,000,000(1+0.02)^6$   
 $y = 16,000,000(1.02)^6$   
 $y = 18,018,598.71 \approx \boxed{18,018,598 \text{ people}}$

2) Since 1995, the daily cost of patient care in community hospitals in the United States has increased about 4% per year. In 1995, such hospital costs were an average of \$968 dollars per day.

a) Write an equation to model the cost of hospital care since 1995.

$a = 968$        $y = a(1+r)^x$   
 $r = 4\% = 0.04$        $y = 968(1+0.04)^x$   
 $y = 968(1.04)^x$

b) Use your equation to estimate the approximate cost per day in 2010.

$x = 2010 - 1995 = 15$

$y = 968(1.04)^{15}$   
 $y = 1,743.313313$   
 $y = 1,743.31$   
 $\$1,743.31 \text{ per day in 2010}$

ROUND TO THE NEAREST HUNDRETH!

$$D = \frac{m}{V}$$

Name \_\_\_\_\_ Period \_\_\_\_\_

## Density Worksheet

In order to receive full credit, you must show ALL work and circle your final answer. Always write the units!!!!

1. 100 grams of a liquid completely fill a 200 mL bottle. What is the density of the liquid?

$$\frac{100g}{200mL} = 0.50g/mL$$

2. A solution has a density of 1.50 g/mL. How many grams are needed to obtain 10.0 mL of solution?

$$10.0mL \times \frac{1.50g}{1mL} = 15g$$

3. If a block of copper measures 2.00 cm x 4.00 cm x 5.00 cm and weighs 356 grams, what is its density?

$$V = 2.00cm \times 4.00cm \times 5.00cm = 40.00cm^3$$

$$D = \frac{356g}{40.00cm^3} = 8.90g/cm^3$$

A house is worth \$300,000. It loses 6% of its value every year. Write an equation to represent the scenario.

$$y = a \cdot b^x \rightarrow y = 300,000(1-0.06)^x$$

a) How much is the house worth in 4 years?

$$y = 300,000(0.94)^4$$

$y = \text{VALUE HOUSE } \$$

$$y = 234,224.69$$

b) How much value does the house lose from its original value in 7 years?

$$y = 300,000$$

### Inverse Proportion

- It takes 4 people 2 days to paint a wall. How long would it take if we got 8 people to do it?
- 3 friends want to go camping and they pack enough water to last for 6 days. Just as they are about to leave they are joined by 3 more people. How long will their water last now?
- The time taken for a water heater to boil water is inversely proportional to the power of the water heater. When the power is 2000 Watts it takes 240 seconds to boil the water. Find the time it takes to boil water when the power is reduced to 1000 Watts.
- The time taken for passengers to be checked-in for a flight is inversely proportional to the number of staff working. It takes 30 minutes for passengers to be checked-in when 5 staff are working. How long will it take if 15 staff are working?
- The number of days to complete research is inversely proportional to the number of researchers who are working. The research takes 125 days to complete if 5 people work on it. Find how many people are needed to complete the research in 25 days?
- The same 3 friends from before want to go camping again. This time they pack enough water to last 9 days. As they are about to leave they are joined by 5 more people. How long will their water last now?
- The amount of sheep in a field is inversely proportional to the time taken for them to eat all of the grass in the field. When there are 100 sheep in a field it takes them 28 days to eat all of the grass. How many days would it take 45 sheep to eat all of the grass?
- It takes an aeroplane 5 hours to fly from London to New York at 500 mph. How long would it take if the aeroplane flew at 600 mph?
- It takes 14 hours for a tap with a flow of 18 litres per minute to fill a reservoir with water. How long will it take if its flow is reduced to 7 litres per minutes?
- The time required to build a house is inversely proportional to the number of builders, all working at the same rate.  
If there are 6 builders, it takes 80 days to complete the house.  
How many builders must be employed to build the house in just 16 days?

4.5 exponential growth and decay word problems worksheet. Growth and decay word problems worksheet pdf. Exponential growth and decay word problems worksheet algebra 1. Exponential growth and decay word problems worksheet kuta. Exponential growth and decay word problems worksheet answers unit 3. Exponential growth and decay word problems worksheet. Continuous exponential growth and decay word problems worksheet. Growth and decay word problems worksheet with answers.

What Is a Remodeling Contract?The concept of remodeling, renovating, redecorating, and reinventing different real estate properties has been around for many years. People spend time and money to craft a new look for their place and make it more comfortable and beautiful. Besides that, some want to have homes built with eco-friendly materials and systems. And over the years, newly developed technology provides better housing appliances that meet the demands of these homeowners. Moreover, remodeling is necessary when the house, establishment, or property requires a change of scenery. Remodeling contracts hold the arrangements, specifications, and restrictions that the homeowner and the general or independent contractor agreed on for the project. The document has a complete description of the project, selected schedules, and outline of the tasks and activities that everyone should follow. If there should be changes, both parties have to meet to discuss the situation. Whether it's residential construction projects or commercial renovation plans, the owner should get a remodeling contract. Benefits of Remodeling the PropertyReinventing some rooms or spaces in homes can take up time and resources, much more the effort of the homeowner. But the extra work to beautify the property will be favorable for the owner. In a 2019 year-end report, Statista provided an estimated growth range in the home improvement industry. It stated that the sector, with its developing economy, will reach \$454.6 billion revenues by 2023. In a way, taking care of the property is an investment. And if necessary, the homeowner or proprietor can remodel some locations to make the area better. So, what are the advantages of revamping your place?Increase Home Value: The appraisal of the property increases when additional rooms or expansions are added in the real estate. Moreover, refurbishing some parts of the house, particularly the kitchen and bathroom, proves to be one of the assets that invite buyers. HGTV reports that homeowners who invest in remodeling homes will regain at least 60% and more than 100% of their investment through a reconstructed kitchen. But homeowners should avoid overhauling the kitchen when it's currently in good condition. Simple repairs like changing creaky doors and cracked mirrors or window sill can make a difference.Home Security: Some people remodel their houses to upgrade their present home security. With newly installed security systems and better surveillance, the owners can detect trouble around the premises. Not limited to technology, home remodeling also helps owners see sections in the house that need repair or maintenance. For instance, a house inspection will not overlook faulty wiring or electrical problems in different rooms. Through remodeling, this dilemma—which can be more significant in the future, if ignored—will be less and infrequent.More Comfortable for Residents: With remodeling, the homeowners will notice various rooms in the property that require changes. Homes should provide comfort and safety for the inhabitants. It's the place that people look forward to at the end of the day. That said, the various rooms in the house should be cozy and clean for everyone staying in the property. At the end of the day, investors, especially the ones searching for homes, want homes which are comfy and safe.Improved Home Style: Another benefit of remodeling houses is an enhanced sophistication in the style of the property. Part of that improvement is efficient home tools and appliances. An example would be using CFL bulbs rather than traditional lights. CLF (Compact Fluorescent Light) bulbs use 75% less energy that can help the homeowner and the environment. Some homeowners want wooden floors in their kitchen instead of tiles. With that, they can call flooring contractors and craft contracts to complete the job. Although the trends in home improvement gradually change over time, making developments in the property has its rewards and beautifying lawns, these kinds of shows are entertaining to the masses. But importantly, most homeowners choose to remodel their kitchens and bathrooms more than any room in the house. The National Association of Home Builders released the results of their 2017 survey and revealed that 81% of home remodeling was for bathrooms and 78% lent for kitchens. However, there are still homeowners who remodel more than the kitchen and bathroom areas. So, let's discuss the trending remodeling projects.Kitchen RenovationsAccording to Home Advisor, the average cost of remodeling the kitchen can range from \$4,500 to \$50,000 depending on the preference of the homeowner. It added that cabinet or hardware takes up 30% of the expenses. But not all kitchen changes are high-end, simple redecorations are also the trend. For example, choosing different brands for kitchen equipment to save energy can count as home improvement. Again, the cost of the project depends on the materials used by contractors and the kitchen appliances chosen by homeowners. For now, fresh and bright paint coupled with sufficient window spacing is the current trend.Bathroom ReinventionsMore than the place for relaxing and comfort, bathrooms continue to be one of the favorite places in the house. When homeowners become stressed from work, they can spend their evening soaked under a bubble bath. Unlike kitchen renovations, bathroom remodeling is a little bit costly, with prices ranging from \$6,000 to \$35,000 or higher. Most of it can be attributed to bathtubs and pricey bathroom cabinets. Sometimes, homeowners also add a TV set in the room to watch movies while enjoying the evening. Nevertheless, it's an excellent investment.Room RemodelingInstead of remodeling only one or two parts of the house, many homeowners opt to revamp other spaces. From redecorating old and used rooms to refurbishing the home office, residents can do almost anything to improve the style of their homes. Home Advisor calculates that home renovations can cost between \$18,425 to \$75,492, depending on the materials and design that the homeowner wants. Right now, cost-effective windows and environmental-friendly elements matter to many proprietors. For illustration, bookshelves and simple cabinets can also boost the aesthetics of an apartment room for rent or sale.Basement BeautificationNot all homes have basements. But if the house has one, the tendency of the area being crowded or unsightly can be a little high. However, Money Crashers comments that homeowners have frequently used basements as the second living room in the household. Some converted the space into a storage room, game room, or study room. Compared to kitchen and bathroom remodeling, basement renovations can cost up to \$11,000 and can even go beyond \$30,000. But if space is in better condition, the expenses will be less.How To Determine When to Remodel the PropertyThe solace we call home can go to disrepair for different reasons. Sometimes, aging can be the primary cause of the infrastructure's slow collapse. And in other circumstances, tumultuous weather conditions can damage the exterior and interior surfaces of the house. In 2018, the Joint Center for Housing Studies of Harvard University (JCHS) presented a report about the remodeling market in the United States of America. The results projected that Americans spend an estimated \$340 billion for home remodeling alone. It also states that the economy pushes more people to reconsider home improvements. But before you start breaking down the walls of your living room or buying dozens of tile floors, you should determine if your house or property really needs to remodel.Step 1: Showing Signs of DeteriorationWhen the property manifests signs of decay, it's time for real estate remodeling. Some indications that are easy to spot are leaking roofs, peeling paint, and creaking floorboard. On the other hand, infestations of roaches, termites, and rats will be difficult to detect without equipment. With that, homeowners or property landlords need to conduct regular checkups to know the situation of the building.Step 2: Too Bare or Too CongestedBesides the clear evidence of a decline in the value of the property, real estate owners can still do improvements to the property if the space becomes too crowded or too deserted. If hesitant about giving away books, clothes, or other valuable things, the owner can choose to renovate the place to accommodate the influx. On the contrary, remodeling can also happen if the area is too empty—adding more furniture, appliances, and other decorations.Step 3: Disruption of Daily Routine or FunctionA renovation will be the priority if the homeowners can no longer function properly while staying in the specific room. For instance, cooking in the kitchen is exhausting because of uneven tiles. Instead of waiting for other parts of the house to be dysfunctional, homeowners should start remodeling when the daily routine gets disrupted.Step 4: Funds are AvailableProperty owners can begin creating their refurbishing proposals if they have enough budget. In most cases, house renovations are costly. And it gets more expensive if the property shows signs of deterioration in different areas. To reiterate, regular home or real estate inspection helps lessen the chance of infestations and undetected issues within the house or building. So make schedules for the next checkup.FAQsThe remodeling contract serves as a guide for you and the hired general contractor. The specifications to include are the following: (1) the rooms or areas covered in the renovation plan; (2) the list of materials to use; (3) the duration of the project, an estimate ranging from weeks to months; (4) salary and compensation of the contractor; (5) necessary permits, licenses, and other documents. You have to make sure these elements are in the contract.Yes, the contract requires the signatories of both the homeowner (or landlord) and the hired independent or general contractor. As the formal document that proves the transaction between the two parties, contracts should contain the signatures of the people involved in the plan or project.Since home improvements and renovations are expensive, you have to consider the opinion of experts before hiring contractors. Check your home and make a checklist of areas that you think requires an overhaul. Then, ask professionals to inspect the property. But if you have sufficient funds, you can redecorate the home right away.Instead of having a fixed and strict budget, you can opt to have an estimate of the work covered. In preparation for possible additional construction costs, make sure you can allot extra funds for the project. The safety of the property remains a priority. So, if necessary, include contingency plans.The task of remodeling a house or an establishment is quite challenging. Homeowners have to continually examine the results of the hired contractors and subcontractors to make sure the outcome meets their demands and expectations. They have to check the current budget, and they have to analyze which plan works best to their advantage. Nevertheless, their investment in time, money, and energy is rewarded not only through monetary benefits but with the safety and happiness of everyone living in the property.

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