

I. The following word problems are geometric sequences or finite geometric series. Show work!!

- 1.) Suppose a ball is dropped from a height of 24 feet. Each time the ball falls, it rebounds 60% of the height from which it fell. How high does the ball rebound after the fifth bounce?
- 2.) Hi-Tech Electronics advertises a weekly install plan for the purchase of a popular brand of plasma television. The buyer pays \$5 at the end of the first week, \$5.50 at the end of the second, \$6.05 at the end of the third, etc. for a year. What will be payment be at the end of the one year?
- 3.) Hugh emails a joke to 5 friends on Sunday morning. Each of these friends emails the joke to 5 of her or his friends on Monday morning, and so on. Assuming no duplication, how many people will have heard the joke by the end of Saturday, not including Hugh?
- 4.) A culture initially contains 200 bacteria where the number of bacteria doubles every 2 hours. How many bacteria will be in the culture at the end of 12 hours?
- 5.) The population in Florida in 1983 was 10.62 million and in 1987 was 11.92 million. What will the population be in 2000? (n is the numbers of years after 1979 and round “r” to three places)
- 6.) Gerry’s previous salary was \$40,000 per year. At the end of the first year, he was given a raise, resulting in an annual salary of \$41,600. What would his salary be if he receives four more identical raises?
- 7.) Rob is installing a fence. He is using a sledgehammer to drive pointed fence posts into the ground. On his first swing, he drives the post 8 inches into the ground. The post is 50% deeper after Rob’s previous swing. How many swings will it take Rob to drive the post a total of 15.75 inches into the ground?
- 8.) A pile driver drives a post 27 inches on its first hit and 8 inches on its fourth hit. The depth of the driver after each additional hit is a constant rate. What is the value of this rate?
- 9.) A company is offering a job with a 5 % raise after the first year of working at the job. If that 5% raise continues every year, then after 40 years, a person’s salary will be \$3,624,000. What does the company offer as its starting salary for this particular job?
- 10.) A ball is dropped from a height of 16 feet. Each time it drops, it rebounds 80% of the height from which it is falling. What is the total distance traveled in 15 bounces?

II. The following word problems are infinite geometric sequences. Show work!!

- 11.) On its first swing, a pendulum travels 8 feet. On each successive swing, the pendulum travels $\frac{4}{5}$ the distance of its previous swing. What is the total distance traveled by the pendulum when it stops swinging?
- 12.) A hot-air balloon rises 90 feet in its first minute of flight. If the final height of the balloon is 900 feet, what is the percent the balloon rises in each succeeding minute?
- 13.) Jasmine’s old grandfather clock is broken. When she tries to set the pendulum in motion by holding it against the side of the clock and letting it go, it first swings 24 cm. The total distance the pendulum swings is 72 cm. How far does pendulum go on its third swing?
- 14.) Joe and Susan are working on problem # 3 on their homework worksheet which asked to state the fraction that repeating decimal 0.6727272... represents. Joe says the answer is $\frac{4}{55}$ and Susan says its $\frac{37}{55}$. Who is correct? Also, explain what the mistake was made to get the incorrect answer.
- 15.) Kim’s little sister likes to swing on the playground. Yesterday, Kim pulled the swing back and let it go. The swing travels a distance before heading back the other way. Each swing afterward was only 70% as long as the previous one. If the total distance the swing traveled is 30 feet, what was the distance traveled after the first swing?
- 16.) Determine if each series either converges to a sum or diverges:

a.) $6 + 4 + \frac{8}{3} + \dots$

b.) $4 - 8 + 16 - \dots$

c.) $-98 - 73.5 - 55.125 - \dots$

d.) $\sum_{n=1}^{\infty} 4\left(\frac{1}{5}\right)^{n-1}$

e.) $\sum_{n=1}^{\infty} 2(4)^{n-1}$

f.) $\sum_{n=1}^{\infty} \frac{1}{2}\left(\frac{5}{4}\right)^{n-1}$