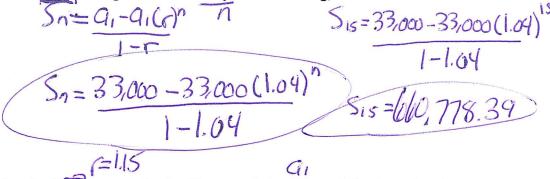
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Date Algebra II

Modeling Series (=1.04

1. Alexa earns \$33,000 in her first year of teaching and earns a 4% increase in each successive year. Write a geometric series formula, S_n , for Alexa's total earnings over n years. Use this formula to find Alexa's total earnings for her first 15 years of teaching, to the nearest cent.



2. Ross has a hobby of collecting comic books. He currently has 50 comic books and each year, he will increase his collection by 15%. Write a geometric series formula, S_{π} , for Ross' total amount of comic books after n years. Use this formula to find the total number of comic books Ross will have 12 years from now.

ve 12 years from now.
$$S_{n} = \frac{Q_{1} - Q_{1}(r)^{n}}{1 - r}$$

$$S_{n} = \frac{S_{0} - S_{0}(1.15)^{n}}{1 - 1.15}$$

$$S_{12} = \frac{S_{0} - S_{0}(1.15)^{n}}{1 - 1.15}$$

3. Dee is planning on decreasing the amount of time she eats fast food per month. After the first month, she ate fast food 42 times. Each month, she eats at fast food restaurants 10% less than the previous month. Write a geometric series formula, S_n , for the total amount of fast food Dee eats after n months. Using your formula, how many total times does she eat fast food in the first four months? Round your answer to the nearest integer.

$$S_{1} = Q_{1} - Q_{1}(r)^{n}$$

$$S_{4} = Q_{0} + Q_{0}(q)^{4}$$

$$I - r$$

$$S_{n} = Q_{0} - Q_{0}(q)^{n}$$

$$S_{4} = Q_{0} + Q_{0}(q)^{4}$$

$$S_{5} = Q_{1} - Q_{0}(q)^{n}$$

$$S_{7} = Q_{1} + Q_{1}(q)^{n}$$

$$S_{8} = Q_{1} - Q_{1}(r)^{n}$$

$$S_{9} = Q_{1} - Q_{1}(r)^{n}$$

$$S_{1} = Q_{1} - Q_{1}(r)^{n}$$

$$S_{1} = Q_{1} - Q_{1}(r)^{n}$$

$$S_{2} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{3} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{4} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{5} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{7} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{8} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{9} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{1} = Q_{1} - Q_{2}(r)^{n}$$

$$S_{2} = Q_{3} - Q_{3}(r)$$

$$S_{3} = Q_{3} - Q_{3}(r)$$

$$S_{4} = Q_{3} - Q_{3}(r)$$

$$S_{5} = Q_{5} - Q_{5}(r)$$

$$S_{7} = Q_{7}(r)$$

$$S_{8} = Q_{1} - Q_{2}(r)$$

$$S_{9} = Q_{1} - Q_{2}(r)$$

$$S_{9} = Q_{1} - Q_{2}(r)$$

$$S_{1} = Q_{2}(r)$$

$$S_{1} = Q_{2}(r)$$

$$S_{2} = Q_{3}(r)$$

$$S_{3} = Q_{3}(r)$$

$$S_{4} = Q_{3}(r)$$

$$S_{4} = Q_{3}(r)$$

$$S_{5} = Q_{5}(r)$$

$$S_{7} = Q_{7}(r)$$

$$S_{8} = Q_{1}(r)$$

$$S_{9} = Q_{1}(r)$$

$$S_{9} = Q_{1}(r)$$

$$S_{9} = Q_{1}(r)$$

$$S_{1} = Q_{2}(r)$$

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$$S_{1} = Q_{2}(r)$$

$$S_{2} = Q_{3}(r)$$

$$S_{3} = Q_{3}(r)$$

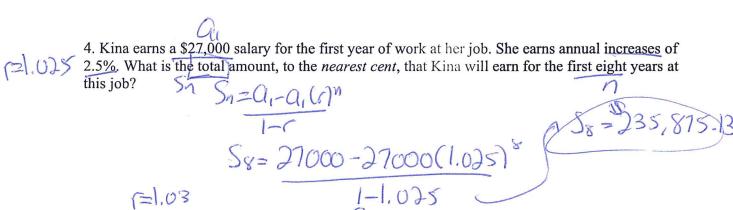
$$S_{4} = Q_{3}(r)$$

$$S_{4} = Q_{3}(r)$$

$$S_{5} = Q_{5}(r)$$

$$S_{7} = Q_{7}(r)$$

$$S_{8} = Q_{7}(r)$$



5. Rowan is training to run in a race. He runs 15 miles in the first week, and each week following, he runs 3% more than the week before. Using a geometric series formula, find the total number of miles Rowan runs over the first ten weeks of training, rounded to the nearest thousandth.

So =
$$\frac{9.9}{1-1.03}$$
 So = $\frac{171.958}{1-1.03}$ So = $\frac{15-15(1.03)}{1-1.03}$ So = $\frac{15-15(1.0$

6. A 7-year lease for office space states that the annual rent is \$85,000 for the first year and will increase by 6% each additional year of the lease. What will the total rent expense be for the entire 7-year lease?

$$S_{1}=Q_{1}-Q_{1}(1)^{n}$$
 $S_{1}=85,000-85,000(1.06)^{7}$
 Q_{1}
 $1-1.06$

7. A fisherman harvests 350 kilograms of crab on Monday. From Monday to Friday, the fisherman harvests 8% less kilograms of crab per day. To the nearest tenth of a kilogram, what is the total amount of crab harvested between Monday and Friday?

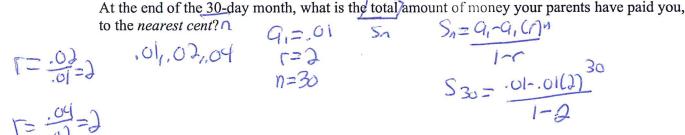
the total amount of crab harvested between Monday and Friday?

$$S_1 = Q_1 - Q_1(C)^n$$
 $S_2 = 350 - 350(.92)^5$
 $S_3 = 350 - 350(.92)^5$
 $S_4 = Q_1 - Q_1(C)^n$
 $S_5 = 350 - 350(.92)^5$
 $S_7 = 350 - 350(.92)^5$

8. A ball is dropped from a height of 32 feet. It bounces and rebounds 80% of the height from which it was falling. What is the total downward distance, in feet, the ball traveled up to the 12th bounce?

ounce?

$$S_1 = G_1 - G_1(1)^n$$
 $S_2 = \frac{32 - 32(.8)^{12}}{1 - .8}$



to the nearest cent?
$$0$$
 $q = 0$
 $q = 0$

\$.01 on the first day, \$.02 on the second day, \$.04 on the third day, and so on.

$$q_{1}=.01$$
 $S_{n}=q_{1}-q_{1}$ C_{1}^{n} $C_{1}=2$ $C_{2}=0$ $C_{2}=0$ $C_{3}=0$ $C_{1}=2$ $C_{2}=0$ $C_{3}=0$ $C_{3}=0$

10. On Sunday, the first day of the week, Natasha does 5 pushups. Each day, she doubles the amount of pushups she does. How many total pushups will Tasha complete at the end of the 7 day week?

9. Your parents want you to do some work around the house. You get them to agree to pay you

$$=5^{-5}1$$

$$=7$$

$$=7$$

$$S_{1}=6^{-6}(2)^{7}$$

$$=7$$

$$S_{2}=635$$

11. Samantha logged her weekly running distances in the table below. If the continues increasing her distance at this rate, what is the total amount of miles Samantha will have ran after 10 weeks

Week	Distance (In Miles)
1	12
2	14.4
3	17.28
4	20.736

$$S_{10} = 12 - 12(1.2)^{10}$$

to the nearest tenth of a mile?

Week Distance (In Miles)

1 12

2 14.4

3 17.28

4 20.736

12. Brian deposited 1 cent into an empty non-interest bearing bank account on the first day of the month. He then additionally deposited 3 cents on the second day. 9 cents on the third day and month. He then additionally deposited 3 cents on the second day, 9 cents on the third day, and 27 cents on the fourth day. What would be the total amount of money in the account at the end of the 20th day if the pattern continued?

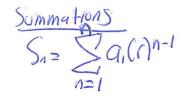
$$(=\frac{.03}{.01}=3)$$
 $(=\frac{.09}{.03}=3)$

$$S_{20} = \frac{3}{1-3}$$

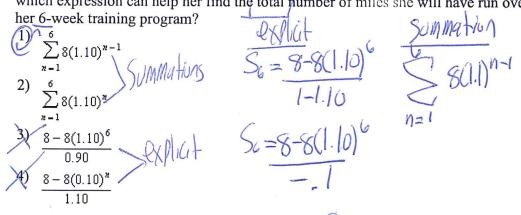
$$S_{20} = \frac{3}{1-3}$$

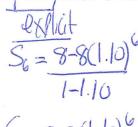
$$S_{20} = \frac{3}{1-3}$$

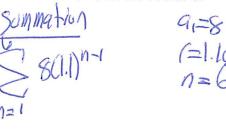
$$S_{20} = \frac{17.433,922}{33}$$



13. Kristin wants to increase her running endurance. According to experts, a gradual mileage increase of 10% per week can reduce the risk of injury. If Kristin runs 8 miles in week one, which expression can help her find the total number of miles she will have run over the course of

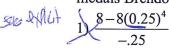






$$\begin{array}{c|c}
3 & 8 - 8(1.10)^6 \\
\hline
0.90 \\
8 - 8(0.10)^* \\
\hline
1.10
\end{array}$$

14. In his first year running track, Brendon earned 8 medals. He increases his amount of medals by 25% each year. Which of the following expressions can be used to determine how many total medals Brendon will have after four years of high school?



$$\frac{8-8(1.25)}{1-.25}$$

$$8 + 8 = 8 - 8(1.25)$$

medals Brendon will have after four years of high school?
$$\frac{8-8(0.25)^4}{-.25}$$

$$\frac{8-8(1.25)^4}{1-.25}$$

Sunmation 2)
$$\sum_{n=1}^{4} 8(0.25)^{n-1}$$

$$4)\sum_{n=1}^{4}8(1.25)^{n-1}$$

below. $\frac{\text{explicit}}{S_{5} = \frac{59,000 - 9000(1.1)^{5}}{1 - 1.1} \frac{\text{Summation}}{\text{Sypoo}(1.1)^{n-1}}$

Year	Amount	
	Saved	
	(in dollars)	
1	59,000	
2	64,900	
3	71,390	
4	78,529	
5	86,381.9	

$$G_1 = 59,000$$
 $G_2 = 59,000 = 1.1$
 $G_3 = 59,000 = 1.1$
 $G_4 = 59,000 = 1.1$

Which expression determines the total amount of money saved by the company over 5 years?

 $\underbrace{\frac{59,000-59,000(1.1)^5}{1-1.1}}$

 $\sum_{n=1}^{\infty} 59,000(1.1)^{(1)}$

- 2) $\frac{59,000-59,000(0.1)^5}{1-0.1}$