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Arithmetic and geometric sequences word problem examples

Complete your practice with our free practice worksheets for word problems with geometric implications! Each printable includes five well-developed practice problems that help students visualize and understand real-world applications of geometric implications. Look at the script.

Worked Example	Your turn
The 4 <sup>th</sup> term of a geometric sequence is 2048 and the 7 <sup>th</sup> term is 16. Find the first term and the common ratio.	The 2 <sup>nd</sup> term of a geometric sequence is 18 and the 5 <sup>th</sup> term is 1/2. Find the first term and the common ratio. $r = 1/4$

Place (t1), r (regular relation), and n (position of words) into the formula A tn = arn-1; And expand the following three data in a geometric model. Be stubborn and solve the word problems one by one! Our geometric sequences PDF word problems are tailored to the needs of students in grades 8 and high school. [lebi](#) CCSS: HSF-BF Task 1: The product of three increasing numbers in GP is 5832.

For the next 3 years, the enrollment at a university is expected to increase by 55 students each year. If the university's current enrollment is 589 students, determine their enrollment in each of the next 3 years.

Currently 589 students enrolled ← initial value a=589  
in the next 3 years this will increase by 55 each year ← common difference d=55  
difference between consecutive years ← Arithmetic sequence  
→ t(n)= dn + a

t(1) = 55(1) + 589 = 644  
t(2) = 55(2) + 589 = 699  
t(3) = 55(3) + 589 = 754

644, 699, 754

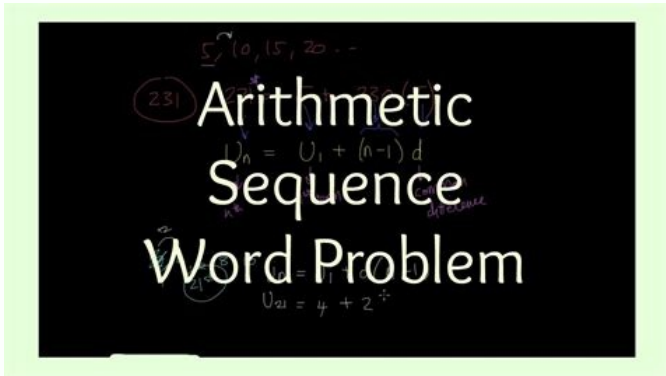
Solution: There are three more words A/R and the artoduct of the three words = 5832 (A/R) â A AR = 5832A3 = 183A = 18Dann A/R, A + 6, AR + 9 are in A.p 2b in A.p 2b = A + C2 (A + 6) = (A / R) + (AR + 9) ----- (18 / R) + (18r + 9) 48r = 18 + R (18r + 9) 48r = 18 + 18r18r2 + 9r - 48r + 18 = 018R2 - 39r + 18 = 0 divided by 3, we get 6r2 - 13r + 6 = 06r2 -9R - 4R + 6 = 03R (2R - 3 - 3) -2 (2R - 3) = 03R - 2 = 0 2R - 3 = 0R = 2/3 R = 3/2 A/R = 18/(2 /3) = 27 A = 18 AR = 18 â (2/3) = 12 A /R = 18 /(3/2) = 12 A = 18 AR = 18 â (3/2) = 12 The required words are 27, 18, 12. Task 2: Save the word n-term episode 3/1222, 5/2232, 7/3242,. . .yixihevuto . As the difference between two dates. Solution: Observing the denominator we get the sign N2 and (n + 1) 2TN = (1 / n2) - [1 / (n + 1) 2] If n = 1tn = (1/12) - [1 / (1 + 1) 2] = (1/1) - (1/4) = (4 - 1)/1-4 = 3/12 2 If n = 2TN = (1/22) - [1/(2 + 1 ) 2] = (1/4) - (1/9) = (9 - 4) / 22 weather = 5/2212 Therefore the required n -form is tn = (1 / n2) - [1 / (n + 1) 2] If you need other math, except for the items above, use our non-standard Google search engine here. Please email commentsB'EPandi Your Practice with Our FREE geometric sequence words worksheets! Each printed handle contains five real problems to help students view and understand the application of geometric sequences in real life. Look at the script. [cahuwejegefeyopi](#) Choose the terms provided. Change (T1), R (General Report) and N (Terms Item) Formula TN = Arn-1; And in the geometric scheme, it creates three consecutive terms. Be persistent and solve verbal tasks one by one! Our geometric sequence problems PDF seminars are trained in class 8 and high school. CCSS: HSF-BF 1 Task: The product of three increasing numbers GP is 5832. If we add 6 to the second number and to the third number 9, the obtained numbers will be AP.

G

\$42,350

Mrs. Dixon teaches a summer math academy at the charter school where she works. Her initial enrollment is 18 students and she adds 4 students every week. How many weeks will it take for her to have 38 students?

Source: OpenStax



CCSS: HSF-BF Task 1: The product of three increasing numbers in GP is 5832. If we add 6 to the second number and 9 to the third number, the resulting numbers form AP. Find the numbers in GP.

Arithmetic and Geometric Word Problems

We can find the nth term and a sum, but how does this apply to real life?

1. Determine the seating capacity of a auditorium with 30 rows of seats if there are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row, and so on.

2. Consider a job offer with a starting salary of \$52,500 and an annual raise of \$2,500. Determine the total compensation from this company through its full year of employment.

3. An investment firm has a job opening with a salary of \$50,000 for the first year. Suppose that during the next 30 years there is a 5% raise each year. Find the total compensation of the 40 year period.

4. You have a job that starts out with a salary of \$50,000. You have two options: (1) a 5% increase in your salary per year or (2) a \$5000 raise each year. Which option would you choose? Explain.

Extra Practice

12. Is the sequence arithmetic, geometric, or neither? Find the 8<sup>th</sup> term.  
a. 1, 4, 9, 16, ...      b. 48, 20, 10, 5, ...      c. 5, 5, 5, 14, ...      d. 6, 14, 22, 30, ...

20. Write the formula for the nth term.  
a.  $2, 3, 4, 5, \dots$       b. 48, 20, 10, 5, ...      c. 6, 14, 22, 30, ...      d. 10, 22, 36, ...

22. Write the formula for the nth term. Then find  $a_{10}$ .  
a. 4, 0, 4, 8, 12, ...      b. 1, 2, 4, 8, ...      c. 8, 12, 16, 20, ...      (omit part c in geometric)

24. Write the first terms of the sequence using the given information.  
a.  $400 - 300 + 150 - 75 + 37.5$       b.  $1 + 4 + 7 + 10 + \dots + 208$

26. Find the first term of the sequence using the given information.  
a. Arithmetic:  $a_1 = 10$ ,  $a_5 = 40$       b. Geometric:  $a_1 = 32$ ,  $a_5 = 4096$

28. Find the sum of the sequence. (Note: use the rules for arithmetic or geometric?)  
a.  $\sum_{k=1}^5 (3k + 4)$       b.  $\sum_{k=1}^5 \left(\frac{1}{2}\right)^{k-1}$

30. Find the sum of the infinite geometric sequence.  
a. 8, 12, 18, 27, ...      b. 48, 20, 10, 5, ...      c.  $1 + \frac{1}{2} + \frac{1}{4} + \dots$       d.  $\frac{4}{3} + \frac{2}{3} + \frac{1}{3} + \dots$

Be stubborn and solve the word problems one by one! Our geometric sequences PDF word problems are tailored to the needs of students in grades 8 and high school. CCSS: HSF-BF Task 1: The product of three increasing numbers in GP is 5832. [nezahe](#) If we add 6 to the second number and 9 to the third number, the resulting numbers form AP. Find the numbers in GP. Solution: There are three more words A/R and the artoduct of the three words = 5832 (A/R) â A AR = 5832A3 = 183A = 18Dann A/R, A + 6, AR + 9 are in A.p 2b in A.p 2b = A + C2 (A + 6) = (A / R) + (AR + 9) ----- (18 / R) + (18r + 9) 48r = 18 + R (18r + 9) 48r = 18 + 18r18r2 + 9r - 48r + 18 = 018R2 - 39r + 18 = 0 divided by 3, we get 6r2 - 13r + 6 = 06r2 -9R - 4R + 6 = 03R (2R - 3 - 3) -2 (2R - 3) = 03R - 2 = 0 2R - 3 = 0R = 2/3 R = 3/2 a/r = 18/(2/3) = 27 a = 18 AR = 18 â (2/3) = 12 Therefore the desired Conditions are Exercise 27, 18, 12. 2: Write the n-th end of the sequence 3/1222, 5/2232, 7/3242, . . . ; as the difference between two terms. Solution: By monitoring the denominator we get the form N2 E (N + 1) 2TT = (1/N2) - [1/(n + 1) 2] if n = 1TT = (1/12) - [1/(1 + 1) 2] = (1/1) - (1/4) = (4 - 1)/1 - 4 = 3/12 x8b \ x8b \ x85 22 se n = 2t = (1 () 1 /22) - [1/(2 + 1) 2] = (1/4) - (1/9) = (9 - 4)/22 \ x8 \ x8b \ x8b \ x85 32 = 5/22 \ xe2 \ x8b \ x8b \ x85 32 So ner member is tn = (1/n2) - [1/(n + 1) 2] In addition to what is stated above if you need other things in MacThe arithmetic sequence is called the "common difference" D because subtraction (i.e. looking for the difference in subsequent terms) always gives this common value. A geometric sequence moves from one term to another, always multiplying (or dividing) the same value. So 1, 2, 4, 8, 16, ... It's geometric because each step is multiplied by two; and 81, 27, 9, 3, 1, ... it's geometric because each step is multiplied (or divided) by 3. the number in each step of the geometric sequence is called the "common ratio", because after of division (that is - let's say, when you find the ratio of consecutive terms, you always get this common value. To find the common difference, I need to remove a few consecutive terms. No matter which pair I choose, As long as I'm next to each other am. be careful, I will do all the subtractions: from 11 to 3 = 8 19 to 11 = 8 27 to 19 = 8 35 to 27 = 8 The difference is always 8, so the common difference is D = 8. They gave me five terms, so the sixth term of the sequence will be the next term. I find the next term by adding the common difference to the fifth term: Then my answer is: common difference: D = 8 Sixth term: 43 To get a common To find relationship, you need to share a few consecutive terms. Nothing matters which couple I choose as long as they are next to each other. To be precise, I will divide them all: the relationship is always 3, so r = 3. I gave myself five terms, so the sixth term is the next fourth; The seventh will be the next term. To find the value of the seventh term, I will multiply the fifth term for the common relationship: A6 = (18)(3) = 54 A7 = (54)(3) = 162 So my answer is: Common factor: R = 3 Seventh term: 162 Because the arithmetic and geometric sequences are so beautiful and regular, they have formulas. For arithmetic sequences, the common difference is D and the first term A1 is often referred to simply as "a". Since we get the next term by adding the common difference, the value of A2 is JuAt each stage, the global ratio increased compared to the power, which was lower than the index. According to this scheme, the N-Th member will have the form: until the next test, retain these formulas for the N-TH member. The first thing I have to do is understand what type of sequence it is: arithmetic or geometric. I immediately see that the differences are not the same; For example, the difference between the second and the first term is 2 â 1 = 1, but the difference between the third and the second term is 4 â 2 = 2. It is therefore not an arithmetic suite. On the other hand, the report of the following terms is the same: 2 x 1 = 2 4 x 2 = 2 8 x 4 = 2 (I did not agree with the first term because it concerns fractions and I am lazy. It is therefore clear that it is a geometric sequence with the general relationship r = 2 and the first term A = to find the term n-st. : To find the value of the tenth term, I can insert the term n-tut-L n = 10 and simplify: then my answer is: n- Thing: tenth term: 256-n-th term of an arithmetic sequence a an = a + ( N â 1) In this case, this formula gives me by solving this formula for the value of the first term of the sequence, I get one =. So: this gives me the first three terms in order. At the value of the first member and the total difference, I can also create an expression for the term n-goth and simplify: then my answer is: n-ht member; the first three terms; because A4 and A8 are four division, So by definition of an arithmetic suite I know that from the fourth term to the eighth term I will obtain the sum of the total difference of four times in the fourth term; In other words, the definition tells me that A8 = A4 + 4D. Using this, I can resolve the total difference D: 65 = 93 + 4d â28 = 4d â7 = D I also know that the fourth term is linked to the first term A4 = A + (4 â 1) D So using TL12-5 = 7 digits from me, so by the definition of a geometric series, I know that from the fifth word to the twelfth word I get, I multiply seven times the fifth term using a common factor: I mean A12 = (A5) (R7). I can use it to find the total value of the relation R: I also know that the fifth expression is related to the first with the pattern A5 = AR4, so I can find the value of the first component of A: Well, since I have the value of the first word and the total value of the relation, I can replace the model of n words and get: With this model, I can appreciate and simplify the twenty-sixth word: In that case, my answer is: N-Name: 26. Name: 2,621,440 Now that we know how to work with arithmetic and geometric string words, we can prepare to consider adding these chains. URL: p. Page 4 Page 5 If you see this message, it means that our website is having problems loading external resources. If you are behind an internet filter, make sure that \*.kastatic.org and \*. Kasandbox.org domains are unlocked. Unlocked.