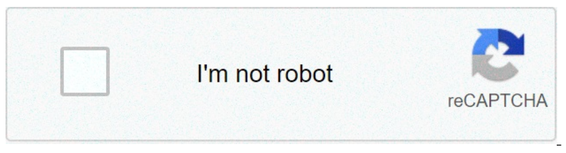

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Arithmetic series word problems with solutions

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In Eldra, a Sequence of Arithermother, sometimes called a progression arithmetic, is a sequence of numbers, such as the difference between any two consecutive peroxus is constant. This constant is called the common difference of sequence. For example, it is an arithmetic sequence with common difference and is an arithmic sequence with common difference; However, and there are no arithmic sequences, such as the difference between consecutive periods varies. More formally, the sequence is a progression arithmetic if and only if. This definition appears more frequently in its form of three terms; What constant, and are in progression arithmetic if and only if. Due to the properties of each term is a common distance than the previous one, all terms of a arithmic sequence can be expressed as the sum of the first term and a multi-difference of the common difference. Let be the first term, be the th term, and be the common difference of any arithmetic sequence; So ,. A common motto is that, given the term Th th and term of an arithmic sequence, the common difference is equal to. Proof: Let's go to the first mandate and the common difference. Then, using the result above if you want it. Another motto is that any of these consecutive terms, and an arithmetic sequence, then is the mother of e. Symbols,. This is mainly used to make replacements. A sum arithmetic is the sum of all terms of a arithmetic sequence. All Infinite Divergem Sést Rie Arithmetic. As for the finite series, there are two primary graphs used to calculate its value. The fist is that if an arithmetic sequence has first term, last term, and total terms, then its value is equal. Proof: Let the sequence be the same, and let your common difference be. So we can write in two ways: adding these two equations cancels all terms involving; And so, as required. The second is that if an arithmetic sequence has first term, common difference, and terms, it has value. Proof: The final term has value. Then by the example above, the sést rie has value that completes the proof. Problems Here are some problems that the test knowledge of sequences and arithmic ethics. Problems Intrawing Intermediary Problems 2003 AIME I, Problem 2 Find the roots of the pollinÃ'mio, given that the roots form a progression arithmetic. See also Sequence Geometric Sequence Series as we studied special types of sequences, let's look at special types of sést rie. Remember that an arithmetic sequence is a sequence in which the difference between two consecutive terms is the common difference, [tortex] d [/ tortex]. The sum of the terms of an arithmetic sequence is called the arithmetic sést rie. We can write the sum of the first [tortex] n [/ latex] terms of a sést rie arithmetic as: [tortex] {s} {n} = {} {1} + \ left ({A} _ {1} + d \ right) + \ left ({A} _ {1} + 2D \ right) + ã, â € | + \ Left ({A} _ {n} -d \ right) + {n} [/ tortex]. We can also reverse the order of terms and write the sum as [tortex] {n} {n} = {a} _ {n} + \ left ({} _ {n} -d \ right) + \ Left ({A} _ {n} -2d \ right) + ~ â € £ | + \ Left ({A} _ {1} + d \ right) + {a} _ {1} [/ latex]. If we add these two expressions to the sum of the first [tortex] n [/ tortex] terms of a sést rie arithmetic, we can derive a formula to the sum of the first [tortex] n [/ wool Tex] Terms of any Sést rie arithmetic. [Tortex] \ frac {\ begin {matrix} {l} {S} _ {n} = {a} _ {1} + \ left ({} _ {1} + d \ right) + \ left ({A} _ {1} + 2d \ right) + A | + \ left ({} _ {n} -d \ right) + {a} _ {n} \ hfill \\ + {s} _ {n} = {A} {N} + \ Left ({A } _ {n} -d \ right) + \ left ({A} _ {n} -2d \ right) + ~ | + \ left ({a} _ {1} + d \ right) + {a} _ {1} \ hfill \ final {matrix}} {2 {s} _ {n} = \ left ({} _ 1} + {a} _ {n} \ right) + \ left ({a} _ {1} + {a} {n} \ right) Ã ¢ | + \ left ({A} _ {1} + {A} {n} \ right)} [/ tortex] Once there are [tortex] n [/ tortex] Terms of SÃ © Rie , we can simplify this sum for [tortex] 2 {s _ {n} = n \ left ({A} _ {1} + {a} {n} \ right) [/ tortex]. We split by 2 to find the film for the sum of the first [tortex] n [/ tortex] terms of a sést rie arithmetic. [Tortex] {s} {n} = \ frac {n \ left ({} _ {1} + {A} {n} \ right)} {2} [/ tortex] One sound © Rie Arithmetic is the sum of the terms of an arithmetic arithmetic The Formula for the sum of the first [tortex] n [/ latex] terms of a arithmetic sequence is [tortex] {s} {n} = \ frac {n \ left (} _ {1} + {1} _ {n} \ right)} {2} [/ LATEX] As: Data Terms of a Serious Arithermetics, find the sum of the terms of the first [tortex] n [/ LATEX]. Identify [tortex] {a} _ {1} [/ tortex] and [tortex] {A} _ {n} [/ tortex]. Determine [tortex] n [/ LATEX]. Replacement values for [tortex] {A} _ {1} \ text {,} {A} {n} [/ tortex], and [tortex] n [/ there Tex] in the film [tortex] {s _ {n} = \ frac {n \ left ({} _ {1} + {A} {n} \ right)} {2} [/ latex] . Simplify to find [LATEX] {S} {N} [/ LATEX]. Find the sum of every sést rie arithmetic. [Tortex] \ text {+ 8 + 5 11 + 14 + 17 + 20 + 23 + 26 + 29 + 32} [/ tortex] [tortex] \ text {20 + 15 + 10 +} LDots {+} -50 [/ tortex] [tortex] \ sum _ {k = 1} ^ {12} 3K - 8 [/ tortex] Solution We are given [tortex] {A} _ {1} = 5 [/ tortex] and [tortex] {A} {n} = 32 [/ LATEX]. The number of terms in sequence to find [tortex] n = 10 [/ LATEX]. Substitute values for [LATEX] {A} {1}, {A} _ {n} {} {\ hspace {0.17em},} [/ LATEX] and [LATEX] n [/ LATEX] in the formula and simplify. [Tortex] \ begin {matrix} {l} \ begin {matrix} {l} \ hfill \\ {s} _ {n} = \ frac {n \ left ({A} _ {1} + {the } _ {n} \ right)} {2} \ hfill \ end {matraty} \ hfill} {10} _ {10} {10} = \ frac {10} Left (5 + 32}) {2} = 185 \ hfill \ final {matrix} [/ tortex] us are given [tortex] {a} _ {1} = 20 [/ tortex] and [tortex] {A} _ {n} = - 50 [/ tortex] .Use the transmula for the general term of a arithmetic sequence to find [tortex] n [/ latex]. [Latex] \ begin {aray} {l} {a} _ {n} = {a} _ {1} _ {1} + \ left (n - 1 \ right) d \ hfill \\ -50 = 20 + \ Left (n - 1 \ right) \ left (-5 \ right) \\ hfill -70 = left (n - 1 \ right) \ left (-5 \ right) \ hfill \\ 14 = N - 1 \\ hfill 15 = n \ hfill \ end {matray} [/ latex] Replace values for [LATEX] {A} {1}, {} _ _ {n} \ text {,} n [/ latex] in the film and simplify. [Tortex] \ begin {matrix} {l} \ begin {matrix} {l} \\ {s _ {n} = \ frac {n \ left ({a} _ {1} _ {n} \ \ right)}} {2} \ End {matraty} \ hfill} \\} {15} =} =} =} {15 \ left (20 - 50 \ right)} {2} = - 225 \ hfill {Array} [/ LATEX] To find [LATEX] {A} _ {1} [/ LATEX], replace [LATEX] k = 1 [/ LATEX] in the explanatory fan. [Tortex] \ begin {matrix} {l} {a} {k} = 3K - 8 \ hfill \\ \ text {} {a} _ {1} = 3 \ left (1 \ right) -8 = - 5 \ hfill \ final {matrix} [/ tortex] We are given that [tortex] n = 12 [/ tortex]. To find [tortex] {a} _ {12} substitute [/ tortex], [tortex] k = 12 [/ tortex] in the explanatory fans. [LATEX] \ Begin {array} {l} {} {} {k} = 3K - 8 \ hfill \\ {} {12} = 3 \ left (12 \ right) -8 = 28 \ hfill \ END {Array} [/ LATEX] Substitute values for [LATEX] {A} {1}, {A _ _ {n} [/ tortex] and [tortex] n [/ latex] in the film and simplify. [Tortex] \ begin {matrix} {l} \ text {} {s} _ {n} = {n \ left ({} _ {1} + {A} {n} \ right) } {2} \ hfill \\ {s} _ {12} = \ frac {12 \ left (-5 + 28 \ right)} {2} = 138 \ hfill \ final {matrix} [/ tortex] Using the Formula to find the sum of every arithmetic sane. [LATEX] \ text {1} \ text {.4 + 1} \ text {.6 + 1} \ text {.8 + 2} \ text {.0 + 2} \ text {.2 + 2} \ text {.4 + 2 \ text {.6 + 2} \ text {.8 + 3} \ text {.0 + 3} \ text {.2 + 3} \ text {.4} [/ latex] SOLUTION [LATEX] \ text {13 + 21 + 29 +} \ Dots \ text {+ 69} [/ latex] Solution [LATEX] \ SUM _ {K = 1} ^ {10} 5 - 6k [/ Latex] Solution on Sunday, after a small surgery, a woman is able to walk half a mile. Every Sunday, she walks from an additional room. After 8 weeks, what will be the total number of miles she walked? This problem can be modeled by a series arithmetic with [latex] {a} {1} =} {1} {2} [/ latex] and [tortex] d = \ frac {1} { 4} [/ LATEX]. We are looking at the total number of miles walked after 8 weeks, for We know that [tortex] n = 8 [/ tortex], and we are looking for [tortex] {S} {8} [/ tortex]. To find [LATEX] {A} _ {8} [/ LATEX], we can use the Explanatory Formula for an arithmetic sequence. [Latex] \ begin {array} {l} {l} {l} {l} {l} {l} {n} _ {n} = {a} _ {1} \ \ left (n - 1 \ right) \ end {array} \ hfill \\ {A} _ {8} = \ frac {1} {2} + \ frac {1} {4} \ left (8-1 \ right) = \ frac {9} {4} \ Hfill \ End {array} [/ latex] Now we can use the film for the arithmetic sést rie. [LATEX] \ Begin {array} {l} {s} _ {n} = \ frac {n \ left ({a} {1} + {A}}} {2} \ hfill \\ \ text {} {S} {8} =} {8 \ left (\ frac {1} {2} + \ frac {9} {4} \ right)} {2} = 11 \ hfill \ End {array} [/ Latex] She had been a total of 11 miles. A man earns $ 100 in the first week of June. Each week, he earns $ 12.50 12.50 than the previous week. After 12 weeks, how much has he won? A £ soluÃ§Ã the sum seriesThe Aritma © tica the terms of a sequÃªncia of Aritma © tica. Ã © the sum of the terms of a sequÃªncia of Aritma © tica. For example, the sum of the first 5 terms of sequÃªncia defined by a 2Na = 1 follows: S5 = a Ã £ n = 15 (2Na 1) = [2 (1) A 1] + [2 (2) 1] + [2 (3) 1] + [2 (4) 1] + [2 (5) 1] = 1 + 3 + 5 + 7 + 9 = 25Adding 5 positive odd integers, as we did earlier, © managable . However, consider adding the first 100 positive integers AMP. That would be very tedious. Therefore, the prÃ³ximo develop a fÃ³rmula that can be used to calculate the sum of the first n terms, denoted Sn, any sequÃªncia of Aritma © tica. In general, Sn = a1 + (1 + d) + (1 + 2d) + A | AnWriting © + is alive Serial has in reverse, Sn = An + (ANA d) + (2d ANA) + A | + A1And equaÃ§Ãµes adding these two together, the terms involving d supplement to zero and n 1 + obtain one of factors: 2SN = (1 + a) + (1 + A) + | + (A + a1) 2SN = n (1 + a) dividing both sides by 2 leads us to fÃ³rmula to the partial sum ENA © seventh an Aritma sum © sequenceThe typical of the first n terms of a sequÃªncia of Aritma © optical fÃ³rmula given by: Sn = N (1 + a) 2:. fÃ³rmula use this to calculate the sum of the first 100 words of sequÃªncia 2Na defined by a = 1 Here a1 = 1 and A100 = 100 199.S100 = (a1 + a100) 2 = 100 (1 + 199) 2 = 10000 Find the sum of the first 50 terms of sequÃªncia given 4, 9, 14, 19, 24, a | SoluÃ§Ã £ o: Determine whether or not £ hÃ¡ the one common difference between the terms. 9A d = 5 = 4 Note that the difference between any two consecutive terms sequÃªncia 5. A © Ã © progresses in fact a £ © Aritma the toxic and can write a = a1 + (n 1) = d + 4 (n 1) = 4 + 5 = 5 5NA 1 5NA Therefore, the general term Ã © one 5NA = 1. to calculate the partial sum 50 of this need sequÃªncia the first and 50th terms: a1 = 4a50 = 5 (50) 1 = 249 PrÃ³ximo use fÃ³rmula 50 to determine the sum of the given part of sequÃªncia Aritma © tica. C Sn = (1 + a) 2S50 50 = (a1 + a50) 2 = 50 (4 + 249) 2 = 25 (253) = 6.325 Response :. S50 = 6325 The first row of seats in an outdoor theater seats 26 m © regard, the second line has © m seats 28, the third line has m 30 © locations, and so on. If there are 18 lines, which Ã © the total capacity of the theater? Figure 9.2 Teatro Romano (Wikipedia) SoluÃ§Ã £ o: Start by finding a fÃ³rmula that Gives The number of seats in any line. Here, The number of seats in each row forms a sequÃªncia: 26,28,30, Ã ¢ | Note that the difference between any two consecutive terms Ã © Ã © 2. sequÃªncia one progresses £ © Aritma the optical where A1 = 26 and d = 2. A = A1 + (n 1) = d 26 + (n 1) 2 + 2Na 2 = 26 + 24 = 2n Therefore, the number of seats in each the line by a given © + 2n = 24. To calculate the total capacity of the lines 18 need to calculate the partial sum 18. To do this we need the first 18 and terms: A1 = 26a18 = 2 (18) + 24 = 60 £ the UtilizaÃ§Ã this calculate the 18 partial sum as follows: Sn = N (1 + a) 2S18 18A = (A1 + A18) 2 = 18 (26 + 60) 2 = 9 (86) = 774 A. There Total 774 seats. Write the first five terms of sequÃªncia Aritma © tica given his first term and common difference. Find a fÃ³rmula for your general term. Given the sequÃªncia Aritma © tica, find a fÃ³rmula to the general term and usÃ¡ it to determine the deadline 100th. 4.4, 7.5, 10.6, 13.7, 16.8, A | Find 50 positive odd integer. Find the 50Âº positive integer pair. Find the term 40 in sequÃªncia consisting of all other positive whole odd: 1, 5, 9, 13, A | find the term in 40 sequÃªncia consisting of all other positive even integer: 2, 6, 10, 14, a | The number Ã © the term 355 in seqÃ¼Ã³ncia Aritma © tica 15, 5, 5, 15, 25, the |? The Number Ã © the term Ã ¢ 172 on seqÃ¼Ã³ncia Aritma © tica 4, a 4, one 12, one 20, one 28, one |? Given the sequÃªncia Aritma © tica defined by the £ Interface = an ANA 1 + 5, where A1 = 2 and N> 1, find a equation that gives the general term in terms of A1 and the common difference. Given the arithmetic sequence defined by the recurrence relation = an ANA 1st, 9 wherein A1 = 4 EN> 1, find a equation that gives the term general in terms of A1 and the difference Common. Given the terms sequÃªncia one of Aritma © tica, find a fÃ³rmula for the general term. Find all mÃ © days Aritma © optical between the terms. Calculate the sum indicated given the fÃ³rmula for the general term. Evaluate. Find the sum of the first 200 positive integers. Find the sum of the first 400 positive integers. The sequÃªncia general term for the numbers of positive odd integers Ã © 2Na determined by a = 1 is the general term for the numbers of positive integers sequÃªncia even © given by a = 2n. Find the following. The sum of the first 50 positive integers AMP. The sum of the first 200 positive integers AMP. The sum of the first 50 minutes © whole the numbers even positive. The sum of the first 200 integers minutes © same positive. The sum of the first k positive odd integers. The sum of the numbers whole minutes © same positive first k. The first row of seats in a small theater seats 8 © composed. Each row thereafter the © comprises more than three seats previous line. If there are 12 lines, how many total seats are £ the theater? The first row of seats in an outdoor theater 42 seats m © account, the second account © m row seats 44, the third row contains 46 locations, and so on. If there are 22 lines, which Ã © the total capacity of the theater? If a pile of bricks has a triangular bricks 37 in the lower row, bricks 34 in the second row and so on with a brick on top. How many bricks sÃ £ onto the stack? Each successive row of a pile of bricks has a triangular brick least Minutes © there is only one brick on top. How many lines that the battery has hÃ¡ 210 total brick? A 10-year salÃ¡rio contract offers $ 65,000 for the first year with an increase of $ 3,200 each additional year. Determine the obrigaÃ§Ã £ total salÃ¡rio during perÃodo 10 years. The clock tower reaches its bell the times indicated Number per hour. In a clock OA ¢ strikes once, two S clock OA ¢ strikes twice and so on. How many times Ã © that the tower clock striking his bell in one day? Ã seqÃ¼Ã³ncia the Fibonacci one seqÃ¼Ã³ncia Aritma © tica? Explain. Using fÃ³rmula for the partial sum of a sequÃªncia ENA © seventh Aritma © optical Sn = N (1 + a) 2 and fÃ³rmula for general term um = A1 + (n 1) d to derive a new fÃ³rmula to the sum seventh partial ENA © Sn = n2 [2a1 + (n 1) d]. Where circunstÂ ¢ TRENDS fÃ³rmula this may be it useful? Explain using an example of your prÃ³pria Creating the £. Discuss mÃ © all for calculating sums where the Andice nA £ starts at 1. For example, I Ã £ n = 1,535 (3n + 4) = 1659. The famous story involves Carl Friedrich Gauss bad behavior at school. As punishment, her teacher atribuÃdo him the task of adding the first 100 integers. The Ã © legend that the young Gauss answered correctly in seconds. What Ã © and the answer as you think he was able to find the sum of £ tÃ quickly? 5, 8, 11, 14, 17; one 3n + 2 = 15, 10, 5, 0, 5; 20A 5N one ¢ = 12, 32, 52, 72, 92; an n 1 = 12, 12, 0, 12, 1; one 12n = 32 1.8, 2.4, 3, 3.6, 4.2; one C = 0.6 + 1.2 = 0.6 N + 1.2 one

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