Arithmetic series worksheet with answers pdf

Determine what type of sequence it is (arithmetic, geometric, linear, quadratic, cubic, or quartic). Give the nth term and value for the specified term.

1	2	3	4	5	6	n	10
40	63	90	121	156	195		

1·90 2·63 3·90
2·20 3·21 2·45
4·10 3·9 3·30
5·18
6·15
7·8 7·10

$(2n+3)(n+7)$

$(2(10)+3)(10+7)$
$23(17)$
$= 391$

Determine what type of sequence it is (arithmetic, geometric, linear, quadratic, cubic, or quartic). Give the nth term and value for the specified term.

1	2	3	4	5	6	n	15
10	4	0	−2	−2	0		

1·10 2·4 3·-2
2·-6 3·-2
3·5

$\frac{(-n+3)(-n+6)}{3}$

$\frac{(-15+3)(-15+6)}{3} = \frac{-12(-9)}{3}$
$= 36$

Determine what type of sequence it is (arithmetic, geometric, linear, quadratic, cubic, or quartic). Give the nth term and value for the specified term.

1	2	3	4	5	6	n	9
4	-12	36	-108	324	-972		

·-3 ·-3 ·-3

$T_n = T_1(r)^{n-1}$
$T_n = 4(-3)^{n-1}$
$T_9 = 4(-3)^{9-1}$
$= 26,244$

Determine what type of sequence it is (arithmetic, geometric, linear, quadratic, cubic, or quartic). Give the nth term and value for the specified term.

1	2	3	4	5	6	n	20
-4	+4.5	-4	2.5	0	-3.5		

×2 +8 +9 -8 5 0 -7
4·2 3·3 2·4 1·5

$\frac{(-n+5)(n+1)}{2}$

$\frac{(-20+5)(20+1)}{2}$
$\frac{-15(21)}{2}$
$= -157.5$

Determine if the sequence is linear, quadratic, cubic, or quartic.

1, -2, -5, -4, 5, 26, 63
-3 -3 1 9 21 37 –
0 4 8 12 16 –
4 4 4 4 –

cubic

Find the sum of the follow series:

$\sum_{i=4}^{25} 3i+5$

+4 +25
3(4)+5 3(25)+5
12+5 75+5
17 80

$S = \frac{n}{2}(t_1 + t_n)$
$= \frac{22}{2}(17+80)$
$= 11(97)$
$= 1067$

Find the arithmetic mean of 12 and 48.

$\frac{12+48}{2} = \frac{60}{2}$
$= 30$

Find the geometric mean of 3 and 27.

$\sqrt{3 \cdot 27}$
$= \sqrt{81} = 9$

Expand $(2a+b)^5$ 1 5 10 10 5 1

$1(2a)^5b^0 + 5(2a)^4b^1 + 10(2a)^3b^2 + 10(2a)^2b^3 + 5(2a)^1b^4 + 1(2a)^0b^5$
$32a^5 + 80a^4b + 80a^3b^2 + 40a^2b^3 + 10ab^4 + b^5$

5. Here are the first three figures of a pattern.


Figure 1

Figure 2

Figure 3

Arithmetic d=+3

a. List the numbers of line segments in Figures 1-7.

Figure	1	2	3	4	5	6	7
Segments	4	7	10	13	16	19	22

b. Write a recursive formula that generates the sequence you found in part a.
$U_n = U_{n-1} + 3 \quad U_1 = 4 \quad n \geq 2$

c. Write an explicit formula that generates the sequence you found in part a.
$U_n = 3n+1$ or $U_n = 3(n-1)+4$

d. How many line segments are in Figure 20?
$U_{20} = 3(20)+1 = 61$

e. Which figure has 145 line segments?
$145 = 3n+1 \quad \frac{144}{3} = n \quad n = 48 \quad (U_{48})$
$144 = 3n$

6. Consider the sequence 0.05, 0.15, 0.45, 1.35, 4.05, ...

a. Write a recursive formula for the sequence. Use u_1 to represent the starting term.
$U_n = 3 \cdot U_{n-1} \quad U_1 = 0.05 \quad n \geq 2$

b. Write an explicit formula for the sequence.
$U_n = 0.05 \cdot 3^{(n-1)}$ or $U_n = .016 \cdot 3^n$

Geometric r=3

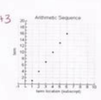
c. What is the 7th term of the sequence?
$U_7 = 0.05 \cdot 3^{(7-1)} \quad U_7 = 0.05 \cdot (729) = (36.45)$

d. Which term of the sequence is the first to be greater than 20,000?
$\frac{20,000}{0.05} = \frac{0.05 \cdot 3^{n-1}}{0.05}$
$400,000 = 3^{n-1}$
$3^{15} = 26,572.05$
(U_{15})

7. Write an equation to define the sequence U_n graphed below.

n	U_n	
1	1	+3
2	4	+3
3	7	+3
4	10	
5	13	
6	16	

d=+3



$U_n = 3n-2$
or
$U_n = 3(n-1)+1$

Name : _____ Score : _____

Teacher : _____ Date : _____

Arithmetic Sequences

Determine whether each sequence is arithmetic. If so, find the common difference.

1) 15.2, 8.5, 1.8, -4.9 ...

2) 8.4, 16.1, 23.8, 31.5 ...

3) 5.1, -0.8, -6.7, -12.6 ...

4) 14.3, 20.3, 26.3, 32.3 ...

Find the first four terms and stated term given the arithmetic sequence, with a_1 as the 1st term.

5) $a_n = 25.5 - 6.8n, a_{10}$

6) $a_n = 25 - 10n, a_5$

7) $a_n = 11 + 9n, a_6$

8) $a_n = 65 - 35n, a_9$

Given the first term and common difference, find the first four terms and the formula.

9) $a_1 = 25, d = 100$

10) $a_1 = 5, d = 5$

11) $a_1 = 24, d = -15$

12) $a_1 = 9, d = -50$

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Comparing Arithmetic and Geometric Sequences Date_____ Period____

For each sequence, state if it is arithmetic, geometric, or neither.

1) 1, 3, 6, 10, 15, ...

2) 40, 43, 46, 49, 52, ...

3) 4, $\frac{13}{3}$, $\frac{14}{3}$, 5, $\frac{16}{3}$, ...

4) −4, 12, −36, 108, −324, ...

5) 4, 16, 36, 64, 100, ...

6) −29, −34, −39, −44, −49, ...

7) 1, 5, 25, 125, 625, ...

8) 1, 4, 9, 16, 25, ...

9) −34, −26, −18, −10, −2, ...

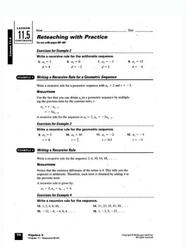
10) 0, 3, 8, 15, 24, ...

11) $a_n = -163 + 200n$

12) $a_n = 16 + 3n$

13) $a_n = -4 \cdot (-3)^{n-1}$

14) $a_n = -\frac{3}{4} + \frac{3}{2}n$



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In this page we have Dimensional analysis worksheet . Hope you like them and do not forget to like , social share and comment at the end of the page. Question 1 Show that expression $v={{v}_{0}}+ at$ is dimensionally correct, where v and ${{v}_{0}}$ represent velocities and a is acceleration and t represents time. Solution Here in this question , we need to compare the dimension of the Left hand side and right hand side LHS $v= [LT^{-1}]$ RHS ${{v}_{0}}+ at = [LT^{-1}] + [LT^{-2}][T]=[LT^{-1}] + [LT^{-1}] =[LT^{-1}] $ So, the dimensions on both the sides are same So , we can say that expression $v={{v}_{0}}+ at$ is dimensionally correct Question 2 Each of the following equations was given by a student during an examination. Do the dimensional analysis of each equation and explain why the equations cannot be correct. Solution a. The expression is $\frac {1}{2}mv^2 = \frac {1}{2}mv_0^2 + \sqrt {mgh}$ LHS $\frac {1}{2}mv^2 = M(LT^{-1})^2= ML^2T^{-2}$ RHS $\frac {1}{2}mv_0^2 + \sqrt {mgh}=M(LT^{-1})^2 + [ML^2T^{-2}]^{1/2} = ML^2T^{-2} + M^{1/2}LT^{-1}$ Now this cannnot be correct as we cannot add quantities of two different dimension. So this equation is incorrect b.The expression is $v= v_0 + at^2$ LHS $v= [LT^{-1}]$ RHS $v_0 + at^2 = [LT^{-1}] + [LT^{-2}]T^2= [LT^{-1}] + [L]$ Now this cannnot be correct as we cannot add quantities of two different dimension. So this equation is incorrect c.The expression is $ma= v^2$ LHS $ma= [M][LT^{-2}]=[MLT^{-2}]$ RHS $v^2 = [L^2T^{-2}]$ Now dimension of LHS is not equal to dimension of RHS So this equation is incorrect Question 3 Suppose that the displacement of an object is related to time according to the expression $x=B{{t}^{2}}$. What are the dimensions of B? Solution Here $x=B{{t}^{2}}$ or $B= \frac {x}{t^2}$ Therefore dimension of B will be =$\frac {[L]}{[T^{2}]}= [LT^{-2}]$ Question 4 Find the SI unit of pressure. Solution SI unit of pressure is pascal Question 5 (a) Is it possible for two quantities to have the same dimensions but different units. (b) Is it possible for two quantities to have same units but different dimensions? Solution a. This is possible . Example Work and Torque have different unit Joule and Newton-meter but the dimension $[ML^2T^{-1}]$ is same b. No it is not possible. Question 6 Suppose we are told that the acceleration ‘a’ of a particle moving with uniform speed ‘v’ in a circle of radius ‘r’ is proportional to some power of r, say rn, and some power of vm. How can we determine the value of n and m. Solution We can write $a \; \alpha \; v^m r^n$ $a= Kv^m r^n$ Where K is the dimensionless constant Now writing dimension of various quantities in the equation $[LT^{-2}]= [LT^{-1}]^m [L]^n$ $[LT^{-2}]=[L^{m+n} T^{-m}]$ Comparing the dimensions of similar quantities on both the sides, we get $m+n=1$ $-m=-2$ or $m=2$ Therefore 2+n=1 or n=-1 Hence the values of m and n are 2 and -1 respectively Question 7 The mass of a solid cube is 856 g, and each edge has a length of 5.35 cm. Determine the density $\rho $ of the cube in basic SI units. Solution Now $\rho = \frac {M}{V}$ Here M= 856 g = .856 kg $V= (5.35)^3 cm^3= (5.35)^3 (1/100)^3 m^3$ $\rho = \frac {.856}{ (5.35)^3 (1/100)^3} kg/m^3 = 5590 kg/m^3$ Question 8 The period ‘T’ of a simple pendulum is measured in time units and is described by \[T=2\pi \sqrt{\frac{l}{g}}\] Where l is the length of the pendulum and ‘g’ is the free fall acceleration in units of length divided by square of time. Show that this equation is dimensionally correct. Solution \[T=2\pi \sqrt{\frac{l}{g}}\] LHS $T = [T]$ RHS $2\pi \sqrt{\frac{l}{g}} = (\frac {[L]}{[LT^{-2}]})^{1/2} = ([T^{2}])^{1/2} =[T]$ So, this equation is dimensionally consistent Question 9 Estimate the average mass density of a sodium atom assuming its size to be about 2.5 Å. (Use the known values of Avogadro’s number and the atomic mass of sodium). Compare it with the density of sodium in its crystalline phase: 970 kg m-3. Are the two densities of the same order of magnitude? If so, why? Question 10 In the following x is in meters, t in seconds, v in m/s and a is in m/s2. Find the SI unit of each combination. a. $\frac{{{v}^{2}}}{xa}$ b.$\sqrt{\frac{x}{a}}$ c. $\frac{1}{2}at^2$ Solution a. $\frac{{{v}^{2}}}{xa}$ $= \frac {(m/s)^2}{m m/s^2}= \frac {(m/s)^2}{(m/s)^2}$ =dimensionless b. $\sqrt {\frac {m}{m/s^2}}= \sqrt {s^2} =s$ c.Here constant 1/2 does not have any units $(m/s^2) s^2 = m$ Download Dimensional analysis worksheet as pdf link to this page by copying the following textDimensional analysis worksheet Also Read 2022. 8. 3. · Software Engineer /Bioinformatics. Job in San Francisco - San Francisco County - CA California - USA , 94199. Company: LatchBio. Full Time position. Listed on 2022-08-03. Job specializations: Science. Biology. Rideshare in California. 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Artists From The Bay Area Blame The Bishop - A band based out of Citrus Heights who exist at the intersection where traditional American rock and British pop meet. The band's namesake and guitarist/singer, Warren Bishop, and fellow guitarist/singer Todd. Police tape blocks the entrance to the Castro Muni Metro train station following a shooting in San Francisco on June 22. San Francisco, CA. 72. 39. 40. 3/5/2022. On the way to San Diego from the Bay Area to celebrate my husband's 41st birthday. Stopped by here to grab a bite. ... Fast Food Open Late Kingsburg. Kingsburg Ca Kingsburg. Late Night Tacos Kingsburg. Mexican Food Kingsburg. Taco Truck Kingsburg. Browse Nearby. Restaurants. Nightlife. Shopping. Chater Camera is a full service motion picture camera and 35mm optics rental house serving the San Francisco Bay Area and all of Northern California. 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This is the original game + expansion. - Raccoon Tycoon and Eternal: Chronicles of the Throne only have been played once. - Digital Eternal code was used. All pieces. Nothing missing. Everything is good to mint condition. Contactless pickup required. Prefer Venmo. do NOT contact me with unsolicited services. 2022. 8. 3. · Job in San Francisco - San Francisco County - CA California - USA , 94199. Company: GPAC. Full Time position. Listed on 2022-08-03. Job specializations: Law/Legal. Lawyer, Legal Counsel, Tax Law, Litigation. Calculate the driving distance and total travel time from San Francisco to Kingsburg by car if you're planning a road trip. Get driving directions from San Francisco, CA to Kingsburg, CA.Compare the flight distance to driving distance from San Francisco, CA to Kingsburg, CA.Or find out if it's better to fly or drive from San Francisco, CA to Kingsburg, CA?. 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