

Find the missing term or terms in each arithmetic sequence.

$$\dots, -37, \underline{\quad}, -27, \dots$$

$\underbrace{\quad}_{+d} \quad \underbrace{\quad}_{+d}$

$$\frac{-27 - (-37)}{2} = 5$$

$$\dots, -3, \underline{\quad}, \underline{\quad}, -303, \dots$$

$\underbrace{\quad}_{+d} \quad \underbrace{\quad}_{+d} \quad \underbrace{\quad}_{+d}$

$$\frac{-303 + 3}{3} = -100$$

Dec 10-11:29 AM

Arithmetic Series (Sum)

Review

Sequences:

Arithmetic $a_n = a_1 + (n-1)d$

Geometric $a_n = a_1 r^{n-1}$



Apr 23-9:48 AM

Let's figure out the formula to find the sum of a finite series.

4 terms

$$2 + 4 + 6 + 8 = 20$$

$$\underbrace{\quad}_{10}$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

6 terms

$$2 + 4 + 6 + 8 + 10 + 12$$

$$\underbrace{\quad}_{14}$$

$$3 \cdot 14 = 42$$

8 terms

$$2 + 6 + 10 + 14 + 18 + 22 + 26 + 30$$

$$\underbrace{\quad}_{32}$$

$$4 \cdot 32 = 128$$

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Sum of Arithmetic Sequence

$$S_n = \frac{n}{2}(a_1 + a_n)$$

n = # of terms

a_1 = 1st term

a_n = last term

S_n = the sum
of the first
"n" terms

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Find the sum of the sequence
5, 8, 11, 14, 17, 20.

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$n=6$$

$$a_1=5$$

$$a_n=20$$

$$S_6 = \frac{6}{2}(5 + 20)$$

$$S_6 = 75$$

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Find the sum of the first seven terms of
4, 10, 16, ...

$$n=7 \quad a_n = a_1 + (n-1)d$$

$$a_1=4 \quad a_7 = 4 + (7-1)6$$

$$a_7=40 \quad a_7=40$$

$$S_7 = \frac{7}{2}(4 + 40)$$

$$S_7 = 154$$



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Find the S_{10} of $\underline{6}$, 18 , 30 , ...

$n = 10$
 $a_1 = 6$
 $a_{10} = 114$

Need to
 find a_{10}
 $a_{10} = 6 + (10-1)12$
 $a_{10} = 114$

$$S_{10} = \frac{10}{2}(6 + 114)$$

$$S_{10} = 600$$

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Find the sum of $3 + 8 + 13 + 18 + \dots + 83$.

$a_1 = 3$
 $a_n = 83$
 $n = ?$

$d = 5$
 $a_n = a_1 + (n-1)d$
 $83 = 3 + (n-1)5$
 $83 = 3 + 5n - 5$

$$83 = 5n - 2$$

$$\frac{85}{5} = \frac{5n}{5}$$

$$17 = n$$

$$S_{17} = \frac{17}{2}(3 + 83)$$

$$S_n = 731$$

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Find the sum of $18 + 25 + 32 + 39 + \dots + 116$.

$$\begin{aligned} a_1 &= 18 \\ a_n &= 116 \\ n &= ? \end{aligned}$$

To find n

$$a_n = a_1 + (n-1)d$$

$$116 = 18 + (n-1)7$$

$$n = 15$$

Then...

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_{15} = 1005$$

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Find the sum of the first 30 multiples of 3.

$$\begin{aligned} n &= 30 \\ a_1 &= 3 \\ a_n &= ? \end{aligned}$$

3, 6, 9, ...

To find a_{30}

$$a_{30} = a_1 + (n-1)d$$

$$a_{30} = 3 + (30-1)3$$

$$a_{30} = 90$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_{30} = \frac{30}{2}(3 + 90)$$

$$S_{30} = 1395$$

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Find the sum of the multiples of 6 from 24 to 120 inclusive.



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Evaluate:

$$\sum_{n=1}^{10} 2n$$



$$\begin{aligned} n &= 10 \\ a_1 &= 2 \\ a_{10} &= 20 \end{aligned}$$

To find a_1
 Plug 1 in for n
 $2(n)$
 $2(1) = 2$

To find a_{10}
 Plug 10 in for n
 $2(n) = 2(10) = 20$

$$S_{10} = \frac{n}{2}(a_1 + a_n)$$

$$S_{10} = \frac{10}{2}(2 + 20)$$

$$\boxed{S_{10} = 110}$$

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Evaluate: $\sum_{n=1}^{15} 3n - 1$

$$n=15$$

$$a_1 = 3(1) - 1 = 2$$

$$a_{15} = 3(15) - 1 = 44$$

$$S_{15} = \frac{15}{2} (2 + 44)$$

$$S_{15} = 345$$



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Find the sum of the sequence
22, 18, 14, 10, 6, 2, -2, -6.



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Find the sum of the first 14 terms of 34, 30, 26, ...



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Find the sum of the first 12 terms of 6, 13, 20, ...



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Find the sum of the first 25 natural numbers.

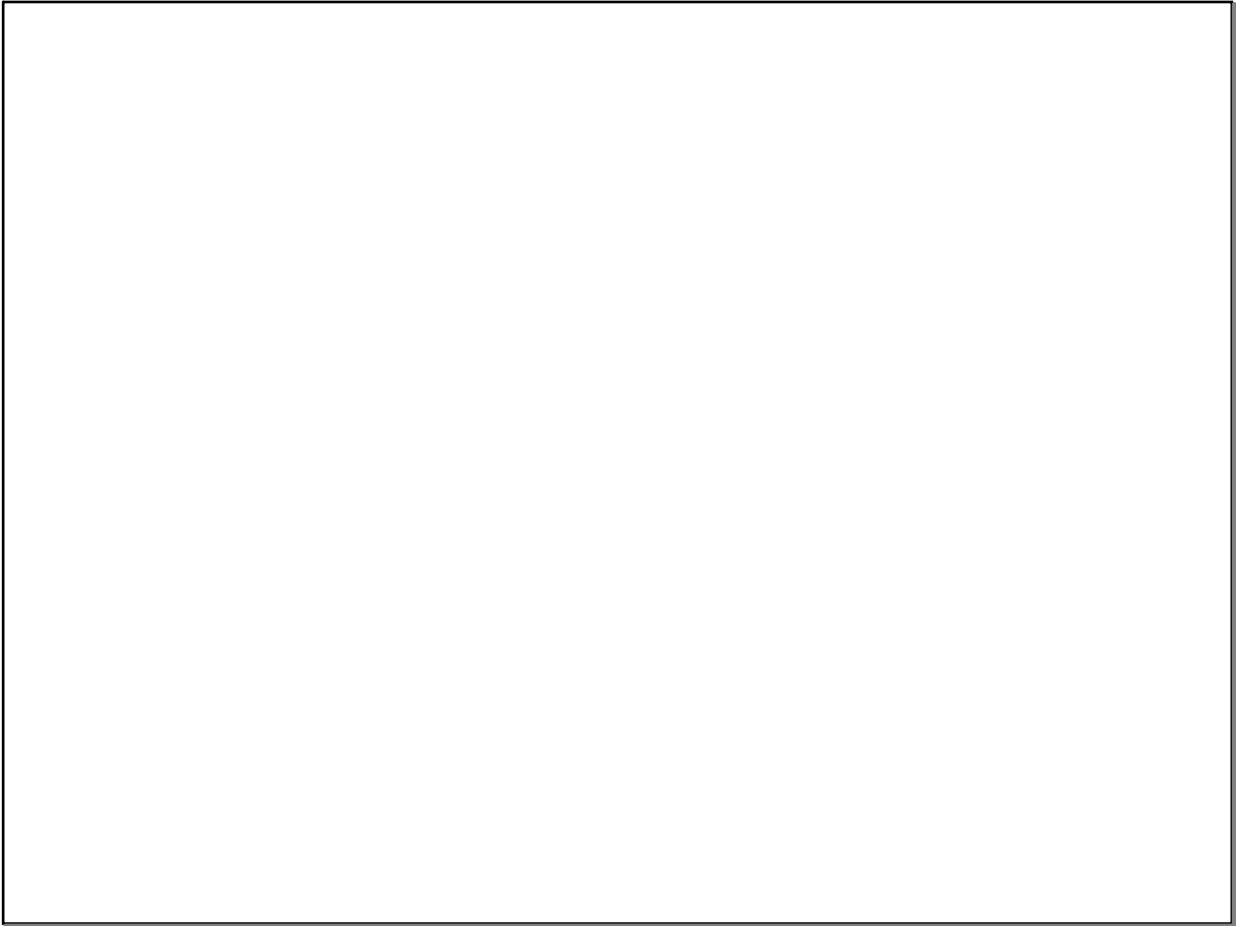


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Homework



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Apr 25-8:23 AM