

**Algebra II**  
**Lesson #5 Unit 9**  
**Class Worksheet #5**  
**For Worksheet #6**

**Algebra 2 Class Worksheet #5 Unit 9**

# Algebra 2 Class Worksheet #5 Unit 9

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$$S_{30} = [3(1)+1]$$

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$$S_{30} = 4$$

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$$S_{30} = 4 + 7$$

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$$S_{30} = 4 + 7 + 10$$

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$$S_{30} = 4 + 7 + 10 + \dots + 85$$

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We will pair up the terms to help calculate the sum.

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The sum of the terms in each pair is 95.



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Since there are 15 pairs,

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For any arithmetic series,  $S_n = \frac{n}{2} ($

The number of pairs.

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For any arithmetic series,  $S_n = \frac{n}{2}(a_1 + a_n)$

The number of pairs.

The sum of the terms  
in each pair.

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For any arithmetic series,  $S_n = \frac{n}{2}(a_1 + a_n)$

What if n is odd????

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$$S_7 = a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7$$

What if n is odd???? Let's see.

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$$S_7 = 4$$

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$$S_7 = 4 + 7$$

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$$S_7 = 4 + 7 + 10$$

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$$S_7 = 4 + 7 + 10 + 13$$

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$$S_7 = 4 + 7 + 10 + 13 + 16$$

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$$S_7 = 4 + 7 + 10 + 13 + 16 + 19$$

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Once again, we will pair up the terms.



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we get 3 pairs, each adding up to 26.

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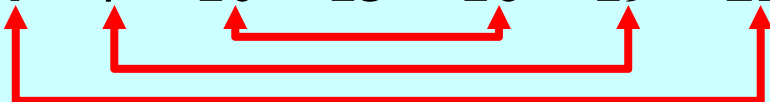
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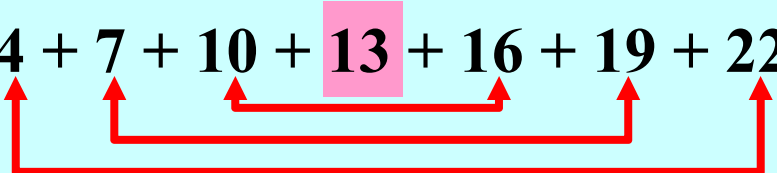
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Notice that the 'odd' term,



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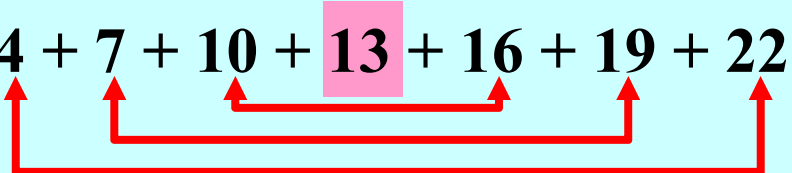
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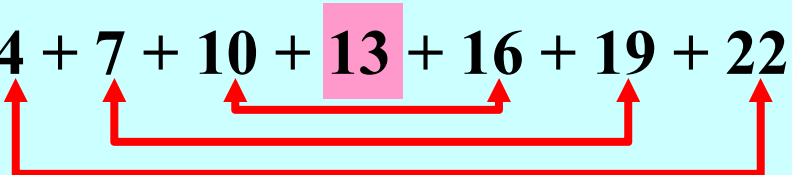
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Notice that the 'odd' term, the middle term, is half of 26 !

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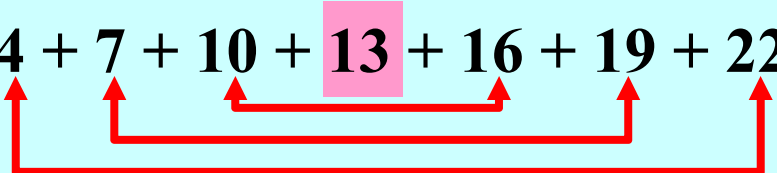
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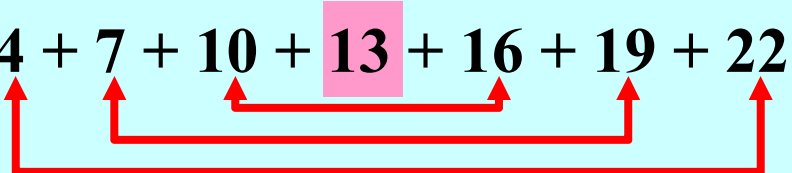
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Therefore, we have  $3\frac{1}{2}$  groups of 26.

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$$S_7 = 4 + 7 + 10 + 13 + 16 + 19 + 22 = \frac{7}{2}(\quad)$$

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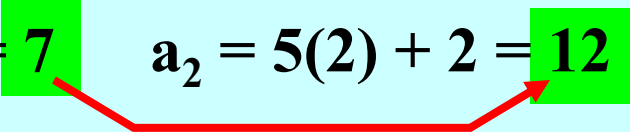
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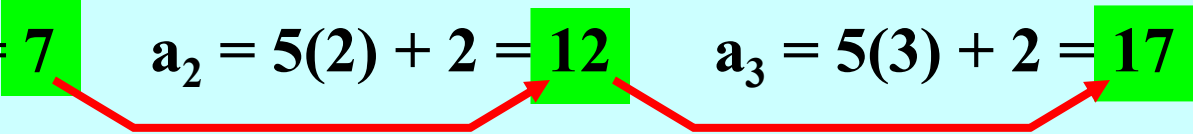
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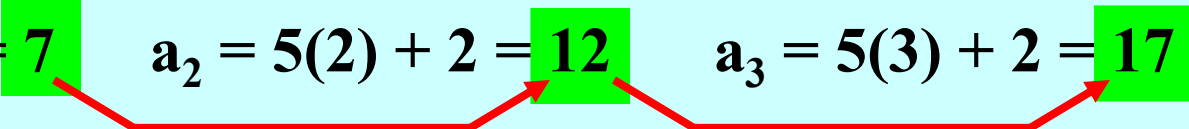
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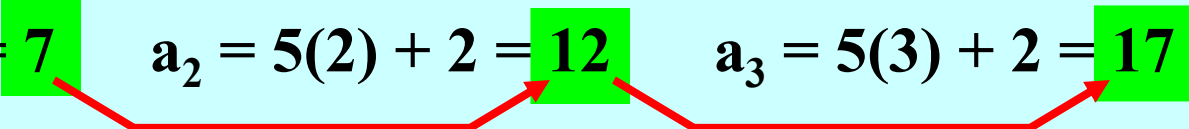
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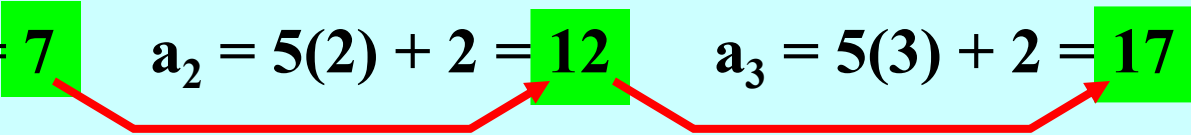


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The first term is 10. Then add 4 recursively.

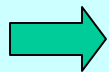


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Solve each of the following problems.

5. Evaluate the series  $5 + 8 + 11 + 14 + \dots + 200$ .

6. Evaluate:  $\sum_{i=1}^{60} (3i + 7)$

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5. Evaluate the series  $5 + 8 + 11 + 14 + \dots + 200$ .

$$a_1 = 5 \quad d = 3$$

The series is arithmetic.  $\Rightarrow S_n = \frac{n}{2}(a_1 + a_n)$

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

$$200 =$$

We need the value of n.

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6. Evaluate:  $\sum_{i=1}^{60} (3i + 7) = 10$

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**Solve each of the following problems.**

**7. An object accelerates in such a way that it travels 2 feet during the first second, 5 feet during the next second, and 8 feet during the third second. If this pattern continues, then how far will the object have moved during the first 30 seconds?**

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The sequence is arithmetic.

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$$S_{30} = 1,365$$

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The object will travel 1,365 feet during the first 30 seconds.

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Let  $a_n$  represent the distance the object travels during the  $n^{\text{th}}$  second.  $\Rightarrow$   $a_1, a_2, a_3, \dots$   
 $2, 5, 8, \dots$

The sequence is arithmetic.  $a_1 = 2$  and  $d = 3$ .

We need to find the sum of the first 30 terms of this sequence.

The series is arithmetic.  $\Rightarrow S_n = \frac{n}{2}(a_1 + a_n)$

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$$a_{30} = 89$$

$$S_{30} = \frac{30}{2}(2 + 89) = (15)(91)$$

$$S_{30} = 1,365$$

The object will travel 1,365 feet during the first 30 seconds.

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**Solve each of the following problems.**

- 8. A job has a starting salary of \$29,000 with a guaranteed increase of \$500 per year. Find the total salary for the first 18 years.**



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Let  $a_n$  represent the salary, in dollars, for the  $n^{\text{th}}$  year.



$$a_1 = 29,000$$

$$a_2 = 29,500$$

$$a_3 = 30,000$$

The sequence is arithmetic.

$$a_1 = 29,000 \text{ and } d = 500.$$

We need to find the sum of the first 18 terms of this sequence.

The series is arithmetic.  $\Rightarrow S_n = \frac{n}{2}(a_1 + a_n)$

$$a_{18} = a_1 + 17d = 29,000 + 17(500) \quad S_{18} = \frac{18}{2}(29,000 + 37,500)$$

$$a_{18} = 37,500$$

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## Algebra 2 Class Worksheet #5 Unit 9

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