

Problems of Arithmetic progressions

1) For each of the following arithmetic progressions find a formula for the n -th term (general term) and the value of the a_{24} term ($d = \text{common difference}$):

a) $a_4 = 20, a_5 = 25$

b) $a_1 = 6, a_2 = 4$

c) $a_5 = 8, a_9 = 12$

d) $a_1 = 2, a_6 = -8$

2) For each of the following arithmetic progressions find a formula for the n -th term (general term) and the value of the a_{19} term ($d = \text{common difference}$):

a) $a_1 = 4, a_7 = 16$

b) $a_1 = 13, a_2 = 18$

c) $a_1 = 15, d = 4$

d) $a_5 = 37, a_{10} = 67$

3) For each of the following arithmetic progressions find a formula for the n -th term (general term) and the sum of the first 27 terms ($d = \text{common difference}$):

a) $a_1 = 13, d = 7$

b) $a_6 = 23, a_7 = 25$

c) $a_1 = 6, a_2 = 4$

d) $a_1 = 10, a_7 = 34$

4) For each of the following arithmetic progressions find a formula for the n -th term (general term) and the sum of the first 26 terms ($d = \text{common difference}$):

a) $a_6 = 14, a_7 = 17$

b) $a_4 = 23, a_9 = 63$

c) $a_1 = 2, d = 1$

d) $a_7 = -7, d = -1$

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Answers:

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| 1) | a) $a_n = 5n, a_{24} = 120$ | b) $a_n = -2n + 8, a_{24} = -40$ |
| | c) $a_n = n + 3, a_{24} = 27$ | d) $a_n = -2n + 4, a_{24} = -44$ |
| 2) | a) $a_n = 2n + 2, a_{19} = 40$ | b) $a_n = 5n + 8, a_{19} = 103$ |
| | c) $a_n = 4n + 11, a_{19} = 87$ | d) $a_n = 6n + 7, a_{19} = 121$ |
| 3) | a) $a_n = 7n + 6, S_{27} = 2808$ | b) $a_n = 2n + 11, S_{27} = 1053$ |
| | c) $a_n = -2n + 8, S_{27} = -540$ | d) $a_n = 4n + 6, S_{27} = 1674$ |
| 4) | a) $a_n = 3n - 4, S_{26} = 949$ | b) $a_n = 8n - 9, S_{26} = 2574$ |
| | c) $a_n = n + 1, S_{26} = 377$ | d) $a_n = -n, S_{26} = -351$ |