



CREST Mathematics Olympiad (CMO) Worksheet *for* Class 10



Topic

Arithmetic Progressions



@crestolympiads



info@crestolympiads.com



+91-98182-94134

Worksheet on Arithmetic Progressions

1. Which term of the A.P. 5, 14, 23, 32, will be 198 more than its 32nd term?
 - a. 52nd
 - b. 55th
 - c. 54th
 - d. 56th
2. What is the sum of the first 55 terms of the A.P. 13, 24, 35,?
 - a. 17150
 - b. 17050
 - c. 17500
 - d. 17250
3. If the fourth term of an A.P. is 28 and the ninth term is 53, then what is the sum of the first 19 terms of the A.P.?
 - a. 1102
 - b. 1112
 - c. 1108
 - d. 1122
4. If the sum of three numbers in A.P. is 78 and their product is 16302, then what is the value of the common difference?
 - a. -7
 - b. -17
 - c. 7
 - d. 17
5. What is the value of x for which the numbers $3x + 2$, $7x - 3$, 25 are in A.P.?
 - a. 4
 - b. 2
 - c. 5
 - d. 3

Answer Key

1. c - 54th

Explanation: Given A.P.: 5, 14, 23, 32,

Thus,

$$a = 5$$

$$d = 14 - 5 = 9$$

We know that $a_n = a + (n - 1) d$

$$a_{32} = 5 + (32 - 1) 9$$

$$= 5 + (31) 9$$

$$= 5 + 279$$

$$= 284$$

Let a_k be 198 more than the 32nd term of the A.P.

$$a_k = a_{32} + 198$$

$$= 284 + 198$$

$$= 482$$

Now we will find the value of k using $a_n = a + (n - 1) d$

$$a_k = a + (k - 1) d$$

$$482 = 5 + (k - 1) 9$$

$$482 - 5 = (k - 1) 9$$

$$477 = (k - 1) 9$$

$$477 / 9 = k - 1$$

$$53 = k - 1$$

$$53 + 1 = k$$

$$k = 54$$

Thus, 54th term of the A.P. is 198 more than its 32nd term.

2. b - 17050

Explanation: Given A.P.: 13, 24, 35,

Thus,

$$a = 13$$

$$d = 24 - 13 = 11$$

$$n = 55$$

We know that $S_n = n \div 2 [2a + (n - 1) d]$

$$S_{55} = 55 \div 2 [2(13) + (55 - 1) 11]$$

$$= 55 \div 2 [26 + (54) 11]$$

$$= 55 \div 2 [26 + 594]$$

$$= 55 \div 2 (620)$$

$$= 55 \times 310$$

$$= 17050$$

3. a - 1102

Explanation: Given: $a_4 = 28$ and $a_9 = 53$

We know that $a_n = a + (n - 1) d$

$$a_4 = a + 3d$$

$$28 = a + 3d \dots (1)$$

$$a_9 = a + 8d$$

$$53 = a + 8d \dots (2)$$

Now, subtracting (1) from (2)

$$53 - 28 = (a + 8d) - (a + 3d)$$

$$25 = 8d - 3d$$

$$25 = 5d$$

$$d = 25 / 5$$

$$d = 5$$

Putting the value of $d = 5$ in equation (1) to find the value of a .

$$28 = a + 3(5)$$

$$28 = a + 15$$

$$28 - 15 = a$$

$$a = 13$$

Now, we know that the sum of n terms of an A.P. is given by:

$$S_n = n \div 2 [2a + (n - 1) d]$$

Here, $n = 19$

$$S_{19} = 19 \div 2 [2(13) + (19 - 1)5]$$

$$= 19 \div 2 [26 + (18)5]$$

$$= 19 \div 2 [26 + 90]$$

$$= (19 \times 116) \div 2$$

$$= 19 \times 58$$

$$= 1102$$

4. c - 7

Explanation: Let $a - d$, a , $a + d$ be the three numbers in A.P.

We are given that their sum is 78.

$$(a - d) + a + (a + d) = 78$$

$$3a = 78$$

$$a = 78 / 3$$

$$a = 26$$

We are given that the product of the numbers is 16302.

$$(a - d) \times a \times (a + d) = 16302$$

$$(26 - d) \times 26 \times (26 + d) = 16302$$

$$(26 - d) \times (26 + d) = 16302 / 26$$

$$262 - d^2 = 627$$

$$676 - d^2 = 627$$

$$676 - 627 = d^2$$

$$49 = d^2$$

$$d = 7$$

5. $d - 3$

Explanation: We know that if the numbers a , b and c are in A.P., then

$$b - a = c - b$$

$$2b = a + c$$

Given: $3x + 2$, $7x - 3$, 25 are in A.P.

Thus, $a = 3x + 2$, $b = 7x - 3$ and $c = 25$

$$2(7x - 3) = (3x + 2) + 25$$

$$14x - 6 = 3x + 27$$

$$14x - 3x = 27 + 6$$

$$11x = 33$$

$$x = 33 / 11$$

$$x = 3$$

More Questions Coming Soon – Keep Learning!



Difference between Ordinary & Extra-Ordinary is that "Little Extra"

Discover Our Ultimate Prep Kits!

Buy Previous Years Papers

1. Login at www.crestolympiads.com/login
2. Go to Dashboard -> Additional Practice -> Buy



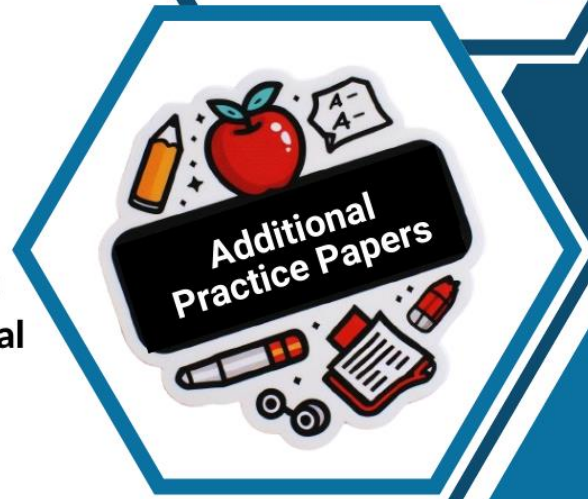
Buy Physical & Digital Workbooks at

<https://www.crestolympiads.com/olympiad-books>



Buy Additional Practice

1. Login at www.crestolympiads.com/login
2. After login, go to Dashboard -> Additional Practice -> Buy



@crestolympiads



info@crestolympiads.com



+91-98182-94134