

Arithmetic Progressions Ex 9.2 Q7

Answer:

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In the given problem, we need to find the common difference and the next four terms of the given
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(i) 1,-2,-5,-8,...

Here, first term $(a_1) = 1$

Common difference (d) = $a_2 - a_1$

= -2 - 1

= -3

Now, we need to find the next four terms of the given A.P

That is we need to find a_5, a_6, a_7, a_8

So, using the formula $a_n = a + (n-1)d$

Substituting n = 5, 6, 7, 8 in the above formula

Substituting n = 5, we get

 $a_5 = 1 + (5-1)(-3)$

 $a_s = 1 - 12$

 $a_5 = -11$

Substituting n = 6, we get

 $a_6 = 1 + (6-1)(-3)$

 $a_6 = 1 - 15$

 $a_6 = -14$

Substituting n = 7, we get

 $a_7 = 1 + (7-1)(-3)$

 $a_7 = 1 - 18$

 $a_7 = -17$

Substituting n = 8, we get

 $a_8 = 1 + (8-1)(-3)$

 $a_8 = 1 - 21$

 $a_8 = -20$

Therefore, the common difference is $\boxed{d=-3}$ and the next four terms are $\boxed{-11,-14,-17,-20}$

(ii) 0, -3, -6, -9,...

Here, first term $(a_1) = 0$

Common difference $(d) = a_2 - a_1$

=-3-0

= -3

Now, we need to find the next four terms of the given $\ensuremath{\mathsf{A.P}}$

That is we need to find a_5, a_6, a_7, a_8

So, using the formula $a_n = a + (n-1)d$

Substituting n = 5, 6, 7, 8 in the above formula

Substituting n = 5, we get

 $a_5 = 0 + (5-1)(-3)$

 $a_5 = 0 - 12$

 $a_5 = -12$

Substituting n = 6, we get

 $a_6 = 0 + (6-1)(-3)$

$$a_6 = 0 - 15$$

$$a_6 = -15$$

Substituting n = 7, we get

$$a_7 = 0 + (7-1)(-3)$$

$$a_7 = 0 - 18$$

$$a_7 = -18$$

Substituting n = 8, we get

$$a_8 = 0 + (8-1)(-3)$$

$$a_8 = 0 - 21$$

$$a_{2} = -2$$

Therefore, the common difference is d = -3 and the next four terms are -12, -15, -18, -21

(iii)
$$-1, \frac{1}{4}, \frac{3}{2}, \dots$$

Here, first term $(a_1) = -1$

Common difference (d) = $a_2 - a_1$

$$=\frac{1}{4}-(-1)$$

$$=\frac{1+4}{4}$$

$$=\frac{5}{4}$$

Now, we need to find the next four terms of the given A.P

That is we need to find a_4, a_5, a_6, a_7

So, using the formula $a_n = a + (n-1)d$

Substituting n = 4,5,6,7 in the above formula

Substituting n = 4, we get

$$a_4 = -1 + (4-1)\left(\frac{5}{4}\right)$$

$$a_4 = -1 + \frac{15}{4}$$

$$a_4 = \frac{-4+15}{4}$$

$$a_4 = \frac{11}{4}$$

Substituting n = 5, we get

$$a_5 = -1 + (5-1)\left(\frac{5}{4}\right)$$

$$a_5 = -1 + 5$$

$$a_5 = 4$$

Substituting n = 6, we get

$$a_6 = -1 + (6-1)\left(\frac{5}{4}\right)$$

$$a_6 = -1 + \frac{25}{4}$$

$$a_6 = \frac{-4 + 25}{4}$$

$$a_6 = \frac{21}{4}$$

Substituting n = 7, we get

$$a_7 = -1 + (7 - 1) \left(\frac{5}{4}\right)$$

$$a_7 = -1 + \frac{30}{4}$$

$$a_7 = \frac{-4+30}{4}$$

$$a_7 = \frac{26}{4}$$

Therefore, the common difference is $d = \frac{5}{4}$ and the next four terms are $\frac{11}{4}, 4, \frac{21}{4}, \frac{26}{4}$

(iv)
$$-1, -\frac{5}{6}, -\frac{2}{3}, \dots$$

Here, first term $(a_1) = -1$

Common difference (d) = $a_2 - a_1$

$$=-\frac{5}{6}-(-1)$$

$$=\frac{-5+6}{6}$$

$$=\frac{1}{6}$$

Now, we need to find the next four terms of the given A.P

That is we need to find a_4, a_5, a_6, a_7

So, using the formula $a_n = a + (n-1)d$

Substituting n = 4,5,6,7 in the above formula

Substituting n = 4, we get

$$a_4 = -1 + (4-1)(\frac{1}{6})$$

$$a_4 = -1 - \frac{1}{2}$$

$$a_4 = \frac{-2-1}{2}$$

$$a_4 = -\frac{1}{2}$$

Substituting n = 5, we get

$$a_5 = -1 + (5-1)(\frac{1}{6})$$

$$a_5 = -1 + \frac{2}{3}$$

$$a_5 = \frac{-3+2}{3}$$

$$a_5 = -\frac{1}{3}$$

$$a_5 = -\frac{1}{3}$$

Substituting $n = 6$, we get
$$a_6 = -1 + (6 - 1)(\frac{1}{6})$$

$$a_6 = -1 + \frac{5}{6}$$

$$a_6 = \frac{-6 + 5}{6}$$

$$a_6 = -1 + \frac{5}{6}$$

$$a_6 = \frac{-6+5}{6}$$

$$a_6 = -\frac{1}{6}$$

Substituting n = 7, we get

$$a_7 = -1 + (7 - 1)(\frac{1}{6})$$

$$a_7 = -1 + 1$$
$$a_7 = 0$$

$$a_{\tau} = 0$$

Therefore, the common difference is $d = \frac{1}{6}$ and the next four terms are $-\frac{1}{2}, -\frac{1}{3}, -\frac{1}{6}, 0$

******* END ******