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कक्षा-10

समांतर श्रेढ़ियाँ

Arithmetic Progressions

अध्याय - 5

भाग - 2

प्रश्नावली 5.1

By : Rajendra Yadav Sir

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प्रश्नावली 5.1

$a,\ a+d,\ a+2d,\ a+3d$

2. दी हुई A.P. के प्रथम चार पद लिखिए, जबकि प्रथम पद a और सार्व अंतर d निम्नलिखित हैं:

(i) a = 10, d = 10

अब, $a_1 = a = 10$

$a_2 = a+d = 10+10 = 20$

$a_3 = a+2d = 10+2\times10 = 30$

$a_4 = a+3d = 10+3\times10 = 40$

$\Rightarrow$ 10, 20, 30, 40

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(ii) a = –2, d = 0

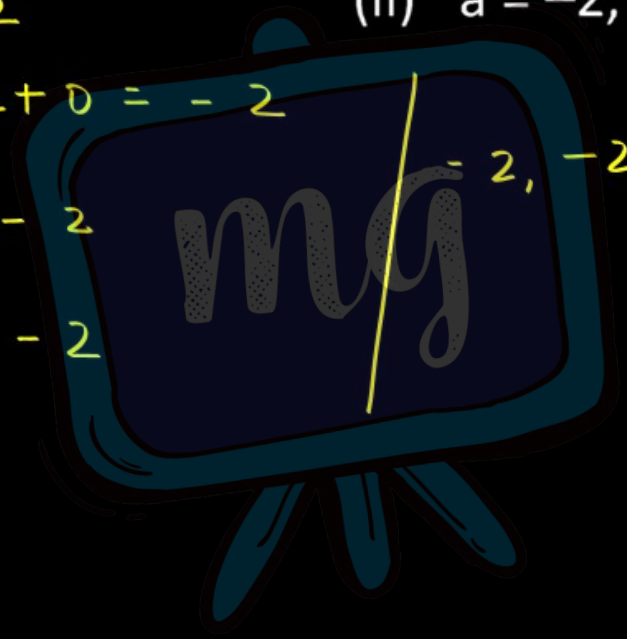
$a_1 = a = -2$

$a_2 = a + d = -2 + 0 = -2$

$a_3 = a + 2d = -2$

$a_4 = a + 3d = -2$

$-2, -2, -2, -2$



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(iii) a = 4, d = – 3

$a_1 = a = 4$

$a_2 = a + d = 4 + (-3) = 4 - 3 = 1$

$a_3 = a + 2d = 4 - 6 = -2$

$a_4 = a + 3d = 4 - 9 = -5$

4, 1, – 2, – 5

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प्रश्नावली 5.1

(iv) $a = -1, d = \frac{1}{2}$

$a_1 = a = -1$

$a_2 = a + d = -1 + \frac{1}{2} = \frac{-2+1}{2} = \frac{-1}{2}$

$a_3 = a + 2d = -1 + 2 \times \frac{1}{2} = -1 + 1 = 0$

$a_4 = a + 3d = -1 + 3 \times \frac{1}{2} = \frac{-2+3}{2} = \frac{1}{2}$

$-1, -\frac{1}{2}, 0, \frac{1}{2}$

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प्रश्नावली 5.1

(v) a = – 1.25, d = – 0.25

$a_1 = a = -1.25$

$a_2 = a + d = -1.25 + (-0.25)$

$= -1.25 - 0.25 = -1.50$

$a_3 = a + 2d = -1.25 + 2(-0.25)$

$= -1.25 - 0.50 = -1.75$

$a_4 = a + 3d = -1.25 + 3(-0.25)$

$= -1.25 - 0.75 = -2$

$-1.25, -1.50, -1.75, -2$

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प्रश्नावली 5.1

प्रथम पद (a) = 3

सार्व अन्तर (d) = 1 − 3

= − 2

3. निम्नलिखित में से प्रत्येक A.P. के लिए प्रथम पद तथा सार्व अंतर लिखिए :

(i) 3, 1, – 1, – 3, . . .

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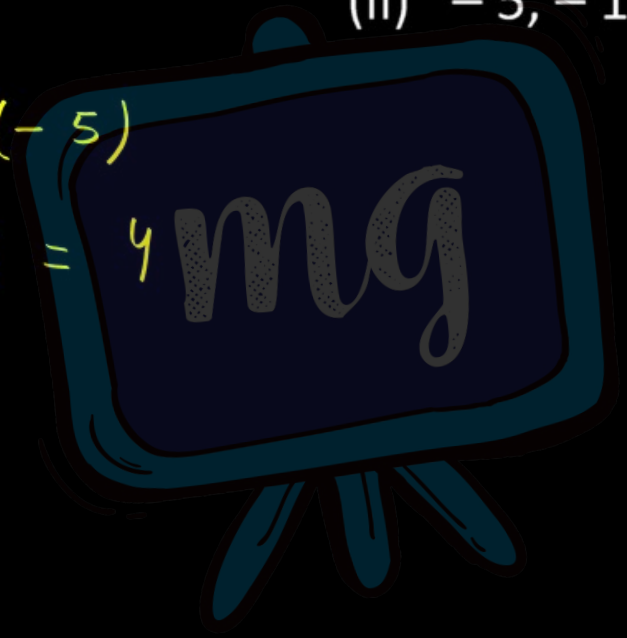
प्रश्नावली 5.1

(ii) $-5, -1, 3, 7, \ldots$

$a = -5$

$d = (-1) - (-5)$

$= -1 + 5 = 4$



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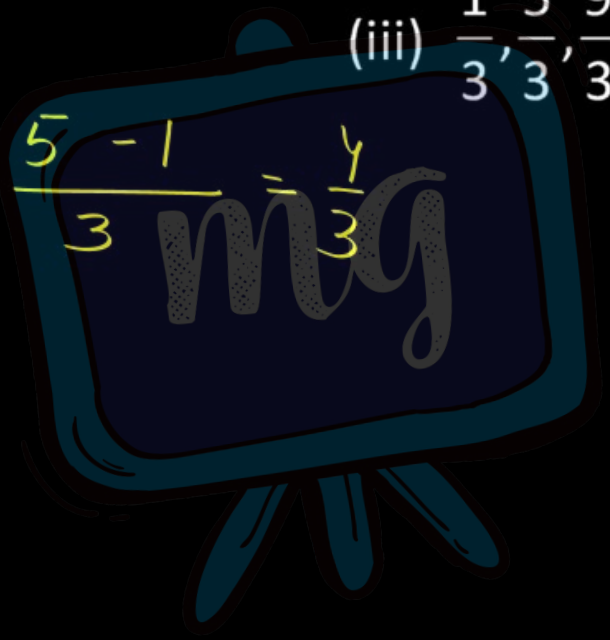
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प्रश्नावली 5.1

(iii) $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \ldots$

$a = \frac{1}{3}$

$d = \frac{5}{3} - \frac{1}{3} = \frac{5-1}{3} = \frac{4}{3}$



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प्रश्नावली 5.1

(iv) 0.6, 1.7, 2.8, 3.9, . . .

$a = 0.6$

$d = 1.7 - 0.6$

$= 1.1$



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प्रश्नावली 5.1

4. निम्नलिखित में से कौन-कौन A.P. हैं? यदि कोई A.P. है, तो इसका सार्व अंतर ज्ञात कीजिए और इनके तीन और पद लिखिए।

(i) 2, 4, 8, 16, . . .

यहाँ $a = 2$

अब, $d = 4 - 2 = 2$

पुनः $d = 8 - 4 = 4$

यहाँ d समान नहीं है।

अतः यह एक A.P. नहीं है।

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प्रश्नावली 5.1

यहाँ $a = 2$

अब. $d = \frac{5}{2} - 2$

$= \frac{5-4}{2} = \frac{1}{2}$

पुन: $d = 3 - \frac{5}{2}$

$= \frac{6-5}{2} = \frac{1}{2}$

(ii) $2, \frac{5}{2}, 3, \frac{7}{2}, \ldots$

इसीप्रकार $d = \frac{7}{2} - 3$

$= \frac{7-6}{2} = \frac{1}{2}$

यहाँ d समान है।

अत: यह एक A.P. है।

$\Rightarrow d = \frac{1}{2}$

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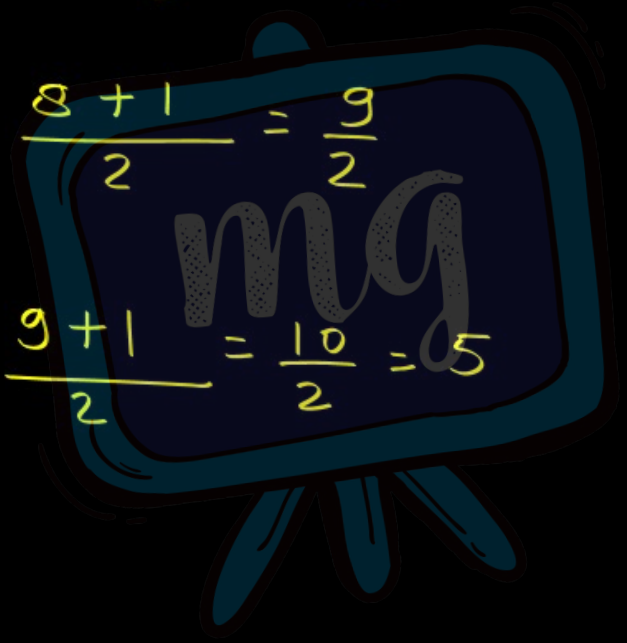
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उत्तर:

1) $\frac{7}{2} + \frac{1}{2} = \frac{7+1}{2} = \frac{8}{2} = 4$

2) $4 + \frac{1}{2} = \frac{8+1}{2} = \frac{9}{2}$

3) $\frac{9}{2} + \frac{1}{2} = \frac{9+1}{2} = \frac{10}{2} = 5$



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प्रश्नावली 5.1

(iii) $-1.2, -3.2, -5.2, -7.2, \ldots$

यहाँ $a = -1.2$

अब, $d = -3.2 - (-1.2)$

$= -3.2 + 1.2 = -2$

पुनः $d = -5.2 - (-3.2)$

$= -5.2 + 3.2 = -2$

इसीप्रकार $d = -7.2 - (-5.2)$

$= -7.2 + 5.2 = -2$

यहाँ d समान है।

अतः यह एक A.P. है।

$\boxed{d = -2}$

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उत्तर: 1) $-7 \cdot 2 + (-2) = -9 \cdot 2$

2) $-9 \cdot 2 + (-2) = -11 \cdot 2$

3) $-11 \cdot 2 + (-2) = -13 \cdot 2$

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प्रश्नावली 5.1

(iv) $-10, -6, -2, 2, \ldots$

यहाँ $a = -10$

अब, $d = -6 - (-10)$

$= -6 + 10 = 4$

पुन: $d = -2 - (-6)$

$= -2 + 6 = 4$

इसीप्रकार, $d = 2 - (-2)$

$= 2 + 2 = 4$

यहाँ d समान है।

अत: यह एक A.P. है।

$\boxed{d = 4}$

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अत: 1) $2 + y = 6$

2) $6 + y = 10$

3) $10 + y = 14$



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प्रश्नावली 5.1

(v) $3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}, \ldots$

यहाँ $a = 3$

अब, $d = 3+\sqrt{2}-3 = \sqrt{2}$

पुनः $d = 3+2\sqrt{2}-(3+\sqrt{2})$

$= 3+2\sqrt{2}-3-\sqrt{2} = \sqrt{2}$

क्रमशः $d = 3+3\sqrt{2}-(3+2\sqrt{2})$

$= 3+3\sqrt{2}-3-2\sqrt{2}$

$= \sqrt{2}$

यहाँ d समान है।
अतः यह एक A.P. है।

$d = \sqrt{2}$

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उत्तर: 1) $3 + 3\sqrt{2} + \sqrt{2} = 3 + 4\sqrt{2}$

2) $3 + 4\sqrt{2} + \sqrt{2} = 3 + 5\sqrt{2}$

3) $3 + 5\sqrt{2} + \sqrt{2} = 3 + 6\sqrt{2}$

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प्रश्नावली 5.1

4. निम्नलिखित में से कौन-कौन A.P. हैं? यदि कोई A.P. है, तो इसका सार्व अंतर ज्ञात कीजिए और इनके तीन और पद लिखिए।



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प्रश्नावली 5.1

(vi) 0.2, 0.22, 0.222, 0.2222, . . .

यहाँ $a = 0.2$

अब, $d = 0.22 - 0.20$

$= 0.02$

पुन: $d = 0.222 - 0.220$

$= 0.002$

यहाँ d असमान है।

अत: यह एक A.P. नहीं है।