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classmate
Date
Page

Ch-5
AP
Exercise 5.1

5.1 (i) $a_n = 3n + 2$

$n = 1, 2, 3, 4, 5$

$a_1 = 3(1) + 2 = 5$

$a_2 = 3(2) + 2 = 8$

$a_3 = 3(3) + 2 = 11$

$a_4 = 3(4) + 2 = 14$

$a_5 = 3(5) + 2 = 17$

(ii) $a_n = \frac{n-2}{3}$

$n = 1, 2, 3, 4, 5$

$a_1 = \frac{1-2}{3} = \frac{-1}{3}$

$a_2 = \frac{2-2}{3} = 0$

$a_3 = \frac{3-2}{3} = \frac{1}{3}$

$a_4 = \frac{4-2}{3} = \frac{2}{3}$

$a_5 = \frac{5-2}{3} = \frac{3}{3} = 1$

(iii) $a_n = 3^n$

$n = 1, 2, 3, 4, 5$

$a_1 = 3^1 = 3$

$a_2 = 3^2 = 9$

$a_3 = 3^3 = 27$

$a_4 = 3^4 = 81$

$a_5 = 3^5 = 243$

(iv) $a_n = \frac{3n-2}{5}$

$n = 1, 2, 3, 4, 5$

$a_1 = \frac{3(1)-2}{5} = \frac{1}{5}$

$a_2 = \frac{3(2)-2}{5} = \frac{4}{5}$

$a_3 = \frac{3(3)-2}{5} = \frac{7}{5}$

$a_4 = \frac{3(4)-2}{5} = \frac{10}{5} = 2$

$a_5 = \frac{3(5)-2}{5} = \boxed{\frac{13}{5}}$

(v) $a_n = (-1)^n \times 2^n$

$n = 1, 2, 3, 4, 5$

$a_1 = (-1)^1 \times 2^1 = -2$

$a_2 = (-1)^2 \times 2^2 = 4$

$a_3 = (-1)^3 \times 2^3 = -8$

$a_4 = (-1)^4 \times 2^4 = 16$

$a_5 = (-1)^5 \times 2^5 = -32$

(vi) $a_n = \frac{n(n-2)}{2}$

$n = 1, 2, 3, 4, 5$

$a_1 = \frac{1(1-2)}{2} = \frac{-1}{2}$

$a_2 = \frac{2(2-2)}{2} = 0$

$a_3 = \frac{3(3-2)}{2} = \frac{3}{2}$

$a_4 = \frac{4(4-2)}{2} = \frac{8}{2} = 4$

$a_5 = \frac{5(5-2)}{2} = \frac{15}{2}$

2(i) $a_n = 5n - 4$

$a_{12} = 5(12) - 4 = 60 - 4$

$= \boxed{56}$

$a_{15} = 5(15) - 4 = 75 - 4$

$= \boxed{71}$

(iii) $a_n = n(n-1)(n-2)$

$a_5 = 5(5-1)(5-2) = 5 \times 4 \times 3$

$= \boxed{60}$

$a_8 = 8(8-1)(8-2) = 8 \times 7 \times 6$

$= \boxed{336}$

(v) $a_n = (-1)^n \times n$

$a_3 = (-1)^3 \times 3 = \boxed{-3}$

$a_5 = (-1)^5 \times 5 = \boxed{-5}$

$a_8 = (-1)^8 \times 8 = \boxed{8}$

3(i) $a_1 = 1, \quad a_n = a_{n-1} + 2$

$n \geq 2$

$\therefore n = 2, 3, 4, 5, 6$

$a_2 = a_{2-1} + 2$

$= a_1 + 2 = 1 + 2 = \boxed{3}$

$a_3 = a_{3-1} + 2$

$= a_2 + 2 = 3 + 2 = \boxed{5}$

$a_4 = a_{4-1} + 2$

$= a_3 + 2 = 5 + 2 = \boxed{7}$

$a_5 = a_{5-1} + 2$

$= a_4 + 2 = 7 + 2 = \boxed{9}$

(iii) $a_1 = -1$, $a_n = \frac{a_{n-1}}{n}$

$n = 2, 3, 4, 5, 6$

$a_2 = \frac{a_{2-1}}{2} = \frac{a_1}{2} = \boxed{\frac{-1}{2}}$

$a_3 = \frac{a_{3-1}}{3} = \frac{a_2}{3} = \boxed{\frac{-1}{6}}$

$a_4 = \frac{a_{4-1}}{4} = \frac{a_3}{4} = \boxed{\frac{-1}{24}}$

$a_5 = \frac{a_{5-1}}{5} = \frac{a_4}{5} = \boxed{\frac{-1}{120}}$

$a_6 = \frac{a_{6-1}}{6} = \frac{a_5}{6} = \boxed{\frac{-1}{720}}$