

$$(x)(y+2) = y-1$$

$$xy + 2x = y - 1$$

$$xy = -1 - 2x + y$$

$$xy - y = -1 - 2x$$

$$\frac{y(x-1)}{(x-1)} = \frac{-1-2x}{x-1}$$

$$y = \frac{-2x-1}{x-1}$$

$$\boxed{f^{-1} = \frac{-2x-1}{x-1}} \quad \text{Ans.}$$

x ~~~~~ x ~~~~~ x

(*) QUESTION 15:

(a) 22, 19, 16, 13, ...

$$a_1 = 22$$

$$d = -3$$

$$a_n = a_1 + d(n-1)$$

$$a_{70} = 22 - 3(70-1)$$

(b) $a_{70} = 22 - 3(69)$

$$a_{70} = 22 - 207$$

$$a_{70} = -185$$

$$S = \frac{k(a_1 + a_k)}{2}$$

$$S = \frac{70 \{22 + (-185)\}}{2}$$

$$S = \frac{70 (22 - 185)}{2}$$

$$S = \frac{70 (-163)}{2}$$

$$S = -5705 \text{ Ans.}$$

x ~~~~~ x ~~~~~ x

(b)

-17, -12, -7, -2, ...

$$a_1 = -17$$

$$d = 5$$

$$a_n = a_1 + d(n-1)$$

$$a_{95} = -17 + 5(95-1)$$

$$a_{95} = -17 + 5(94)$$

$$a_{95} = -17 + 470$$

$$a_{95} = 453$$

$$S = \frac{k(a_1 + a_k)}{2}$$

$$S = \frac{95(-17 + 453)}{2}$$

$$S = \frac{95(436)}{2}$$

$$S = 20,710$$

x ~~~~~ x ~~~~~ x

(c)

3, 9, 15, 21, ...

$$a_1 = 3$$

(44)

$$d = 6$$

$$a_n = a_1 + d(n-1)$$

$$a_{777} = 3 + 6(777-1)$$

$$a_{777} = 3 + 6(776)$$

$$a_{777} = 3 + 4656$$

$$a_{777} = 4,659$$

$$S = k(a_1 + a_k)$$

2

$$S = \frac{777(3 + 4,659)}{2}$$

2

$$S = \frac{777 \left(\overset{2,331}{4,662} \right)}{2}$$

2

$$S = 1,811,187 \text{ Ans.}$$

x x x

(*)

QUESTION 16:

(a)

$$\frac{1}{2}, -\frac{1}{4}, \frac{1}{8}, \dots$$

(45)

$$r = \frac{-1/4}{1/2} = \frac{-1 \times 2^1}{1 \times 4^2} = -\frac{1}{2}$$

$$r = \frac{1/8}{-1/4} = \frac{1 \times 4^1}{-1 \times 8^2} = -\frac{1}{2}$$

$$S = \frac{a_1}{1-r}$$

$$S = \frac{1/2}{1 - (-1/2)}$$

$$S = \frac{1/2}{1 + 1/2}$$

$$S = \frac{1/2}{3/2}$$

$$S = \frac{1 \times 2^1}{3 \times 2^1}$$

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

(16)

x ~~~~~ x ~~~~~ x

(b)

32, -16, 8, -4, ...

$$r = \frac{-16}{32} = -\frac{1}{2}$$

$$r = \frac{8}{-16} = -\frac{1}{2}$$

$$S = \frac{a_1}{1-r}$$

$$S = \frac{32}{1 - (-1/2)}$$

$$S = \frac{32}{1 + 1/2}$$

$$S = \frac{32}{3/2}$$

$$S = \frac{32 \times 2}{3}$$

$$S = \frac{64}{3} \quad \text{Ans.}$$

x ~~~~~ x ~~~~~ x

(c) $3, 2, \frac{4}{3}, \frac{8}{9}, \dots$

$$r = \frac{2}{3}$$

$$r = \frac{2/3}{3/2} = \frac{2}{3}$$

$$S = \frac{a_1}{1-r}$$

$$S = \frac{3}{1 - 2/3}$$

$$S = \frac{3}{1/3}$$

$$S = \frac{3 \times 3}{1}$$

$$\left. \begin{array}{l} R = \frac{2}{3} \\ \frac{1}{1 - \frac{2}{3}} \\ \frac{3 - 2}{1} \\ \frac{1}{1} \end{array} \right\}$$

(48)

$$S = 9 \quad \text{Ans.}$$

x ~~~~~ x ~~~~~ x

(d)

-54, -18, -6, -2, ...

$$r = \frac{-18 \cancel{a^1}}{-54 \cancel{a^3}} = \frac{1}{3}$$

$$r = \frac{-61}{-180} = \frac{1}{3}$$

$$S = a_1$$

$$1 - r$$

$$S = -54$$

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

$$S = -54$$

$$\frac{2}{3}$$

$$S = \frac{-54 \times 3}{12}$$

$$12$$

$$S = -81 \text{ Ans.}$$

Row

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

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

$$3$$

$$\frac{2}{3}$$

(49)

x ~ x ~ x

QUESTION 17:

a $\left(\frac{2x - y}{2}\right)^8$

Let $a = 2x$ and $\frac{-y}{2} = b$

$$(a + b)^8$$

$n = 8$, terms = 9

But we have to find only first four, so

$$(a + b)^8 = \binom{8}{0} a^8 + \binom{8}{1} a^7 b + \binom{8}{2} a^6 b^2 + \binom{8}{3} a^5 b^3$$

$$(a + b)^8 = a^8 + 8a^7 b + 28a^6 b^2 + 56a^5 b^3$$

Substitute the values of $a = 2x$ and $\frac{-y}{2} = b$

$$\left(\frac{2x - y}{2}\right)^8 = (2x)^8 + 8(2x)^7 \left(\frac{-y}{2}\right) + 28(2x)^6 \left(\frac{-y}{2}\right)^2 + 56(2x)^5 \left(\frac{-y}{2}\right)^3$$

50 $= 256x^8 + 8(128)x^7 \left(\frac{-y}{2}\right) + 28(64)x^6 \left(\frac{y^2}{4}\right) + 56(32)x^5 \left(\frac{-y^3}{8}\right)$

$$\left(\frac{2x-y}{2}\right)^8 = 256x^8 - 512x^7y + 448x^6y^2 - 224x^5y^3 \quad \text{Ans.}$$

x x x

(b) $\left(\frac{2x-y}{2}\right)^8$

$n=8, k=7$

Formula: $\binom{n}{k-1} a^{n-k+1} b^{k-1}$

Let $2x = a$ and $\frac{-y}{2} = b$

$$\binom{8}{7-1} a^{8-7+1} b^{7-1}$$

$$\binom{8}{6} a^2 b^6$$

$$28a^2b^6$$

Putting the values back $a=2x$ and $b=-\frac{y}{2}$

$$28 (2x)^2 \left(-\frac{y}{2}\right)^6$$

$$28 (4x^2) \left(\frac{y^6}{64}\right)$$

$$= 28 x^2 \left(\frac{y^6}{16}\right)$$

$\frac{7}{4} x^2 y^6$	Ans.
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x ~~~~~ x ~~~~~ x