

Ex 1.

$$1) a_n = 6a_{n-1} - 9a_{n-2} \quad a_0 = 2, a_1 = 3$$

$$a_2 = 6a_1 - 9a_0$$

$$= 6(3) - 9(2)$$

$$a_2 = 0$$

$$a_3 = 6a_2 - 9a_1 = 6(0) - 9(3)$$

$$= -18$$

$$a_4 = 6a_3 - 9a_2 = 6(-18) - 9(0)$$

$$= -108$$

$$a_5 = 6a_4 - 9a_3 = 6(-108) - 9(-18)$$

$$= -486$$

$$a_6 = 6a_5 - 9a_4 = 6(-486) - 9(-108)$$

$$= -1944$$

$$\therefore 2, 3, 0, -18, -108, -486, -1944, \dots$$

$$2) a_n = 2a_{n-1} - a_{n-2} \quad a_0 = 5, a_1 = 3$$

$$a_2 = 2a_1 - a_0 = 2(3) - 5 \\ = 1$$

~~a_2~~

$$a_3 = 2a_2 - a_1 = 2(1) - 3 \\ = -1$$

$$a_4 = 2a_3 - a_2 = 2(-1) - 1 \\ = -3$$

$$a_5 = 2a_4 - a_3 = 2(-3) - (-1) \\ = -5$$

$$a_6 = 2a_5 - a_4 = 2(-5) - (-3) \\ = -7$$

$$\therefore 5, 3, 1, -1, -3, -5, -7 \dots$$

Ex. 4

$$s_3 = 2s_2 + s_1 - s_0 = 2(4) + (-1) - 2 \\ = 5$$

$$s_4 = 2s_3 + s_2 - s_1 = 2(5) + 4 - (-1) \\ = 15$$

$$s_5 = 2s_4 + s_3 - s_2 = 2(15) + 5 - 4 \\ = 31$$

$$\therefore s_5 = 31$$

Ex. 5

$$b_n = 1.015(b_{n-1}) - 25, \quad b_0 = 280$$

Ex. 6
$$s(n) \{$$
$$\text{if } (n=1)$$
$$\text{return } 3$$
$$\text{return } s(n-1) + ~~2~~ 3 * n$$
$$\}$$

Ex. 4

$$s_3 = 2s_2 + s_1 - s_0 = 2(4) + (-1) - 2 \\ = 5$$

$$s_4 = 2s_3 + s_2 - s_1 = 2(5) + 4 - (-1) \\ = 15$$

$$s_5 = 2s_4 + s_3 - s_2 = 2(15) + 5 - 4 \\ = 31$$

$$\therefore s_5 = 31$$

Ex. 5

$$b_n = 1.015(b_{n-1}) - 25, \quad b_0 = 280$$

Ex 6
$$s(n) \{$$
$$\text{if } (n=1)$$
$$\text{return } 3$$
$$\text{return } s(n-1) + ~~2~~ 3 * n$$
$$\}$$

Ex. 71. Let B_n = number of bacteria after n hours.

(a)

$$B_n = 3B_{n-1}$$

$$(b) \quad B_0 = 10$$

$$B_n = 3B_{n-1}$$

$$= 3^n (B_0)$$

$$B_n = 10(3^n)$$

$$B_{10} = 10(3^{10})$$

$$B_{10} = 590490$$

$$2. \text{Interest} = \frac{0.08}{12} B(k-1)$$

$$= \frac{1}{150} B(k-1)$$

$$B(k) = B(k-1) + r - 150$$

$$= B(k-1) + \frac{1}{150} B(k-1) - 150$$

$$B(k) = \frac{151}{150} B(k-1) - 150, \quad B(0) = 9000$$

$$3. \quad (n+1)^2 = n^2 + 2n + 1$$

$$n^2 = (n-1)^2 + 2(n-1) + 1$$

square(n) {if ($n=0$)

return 0

return square($n-1$) + 2*($n-1$) + 1

Ex. 8

$$a_n \begin{cases} a_1 = 2 \\ a_2 = 3 \\ a_n = a_{n-1} a_{n-2}, n \geq 3 \end{cases}$$

~~a~~ $a(n) \{$ if $(n=1)$

return 2

else if $(n=2)$

return 3

return $a(n-1) * a(n-2)$

}

~~at 1)~~

$a(7)$ $n=7$

Because $n \neq 1$ and $n \neq 2$
return $a(6) * a(5)$

$$a(7) = 1944 * 108$$

$$= 209952$$

return 209952

 $a(6)$ $n=6$

Because $n \neq 1$ and $n \neq 2$
return $a(5) * a(4)$

$$a(6) = 108 * 18 = 1944$$

return 1944

 $a(5)$ $n=5$

Because $n \neq 1$ and $n \neq 2$
return $a(4) * a(3)$

$$a(5) = a(4) * a(3) \\ = 18 * 6 = 108$$

return 108

 $a(4)$ $n=4$

Because $n \neq 1$ and $n \neq 2$
return $a(3) * a(2)$

$$a(4) = 6 * 3 = 18$$

return 18

 $a(3)$ $n=3$

Because $n \neq 1$ and $n \neq 2$
return $a(2) * a(1)$

$$a(3) = 3 * 2 = 6$$

return 6

$q(2)$

$n=2$

Because $n=2$

return 3

$q(1)$

$n=1$

Because $n=1$

return 2

∴ The answer is 209952.

@

$a_7 = 209952$