



Name-Surname:

25.12.2014

ID Number:

CLASSWORK 10

Solve the recurrence relation $4a_{n+2} - 12a_{n+1} + 9a_n = 0$, $a_1 = 24$, $a_2 = 63$
for $n \geq 1$.

Answer:

$$4x^2 - 12x + 9 = 0 \Rightarrow x = \frac{3}{2} \quad (\text{Double Root})$$

$$a_n = c_1 \left(\frac{3}{2}\right)^n + c_2 n \left(\frac{3}{2}\right)^n$$

$$24 = c_1 \frac{3}{2} + c_2 \frac{3}{2}$$

$$63 = c_1 \frac{9}{4} + c_2 \frac{9}{2}$$

$$\Rightarrow a_n = (4 + 12n) \left(\frac{3}{2}\right)^n$$



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Solve the recurrence relation $3a_{n+2} - 14a_{n+1} + 8a_n = 0$, $a_1 = 10$, $a_2 = 20$
for $n \geq 1$.

Answer:

$$3x^2 - 14x + 8 = 0 \Rightarrow x = \frac{2}{3}, x = 4$$

$$a_n = c_1 \left(\frac{2}{3}\right)^n + c_2 4^n$$

$$10 = \frac{2}{3}c_1 + 4c_2$$

$$20 = \frac{4}{9}c_1 + 16c_2$$

$$\Rightarrow a_n = 9 \left(\frac{2}{3}\right)^n + 4^n$$