Worked example

A sequence $a_1, a_2, a_3, \ldots$ is defined by

$$a_1 = 1$$
$$a_{n+1} = (a_n)^2 - ka_n, n \geq 1$$

where k is a constant.

Given that $a_3 = 1$, find the value of:

$$\sum_{r=1}^{100} a_n$$

Your turn

A sequence $a_1, a_2, a_3, \ldots$ is defined by

$$a_1 = 1$$
$$a_{n+1} = ka_n + 5, n \geq 1$$

where a is a positive constant.

Given that $a_3 = 41$, find the value of:

$$\sum_{r=1}^{5} a_n$$

901

Worked example

A sequence $a_1, a_2, a_3, \ldots$ is defined by

$$a_1 = 2$$
$$a_{n+1} = (a_n)^2 - 2, n \geq 2$$

where $p > 0$

a) Find a_3

b) Given that $a_2 = 2$, find the value of p

c) Find the sum of the first 100 terms

d) Find a_{199}

Your turn

A sequence $a_1, a_2, a_3, \ldots$ is defined by

$$a_1 = p$$
$$a_{n+1} = (a_n)^2 - 1, n \geq 1$$

where $p > 0$

a) Find a_3

b) Given that $a_2 = 0$, find the value of p

c) Find the sum of the first 100 terms

d) Find a_{199}

a) $p^4 - 2p^2$

b) $p = -1$

c) -100

d) -1

Worked example

For each sequence:

i) State whether the sequence is increasing, decreasing or periodic.

ii) If the sequence is periodic, write down its order.

a) $u_{n+1} = u_n - 3,\ u_1 = 7$

b) $u_{n+1} = (u_n)^3,\quad u_1 = 2$

c) $u_{n+1} = \cos(45n°)$

Your turn

For each sequence:

i) State whether the sequence is increasing, decreasing or periodic.

ii) If the sequence is periodic, write down its order.

a) $u_{n+1} = u_n + 3,\ u_1 = 7$

b) $u_{n+1} = (u_n)^2,\quad u_1 = \frac{1}{2}$

c) $u_{n+1} = \sin(90n°)$

a) Increasing

b) Decreasing

c) Periodic, order 4