

A2.A.33: Recursive Sequences: Specify terms of a sequence, given its recursive definition

- 1 The first four terms of the sequence defined by

$$a_1 = \frac{1}{2} \text{ and } a_{n+1} = 1 - a_n \text{ are}$$

1) $\frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}$

2) $\frac{1}{2}, 1, 1, \frac{1}{2}, 2$

3) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

4) $\frac{1}{2}, 1, \frac{1}{2}, 2, \frac{1}{2}, 3, \frac{1}{2}$

- 4 Find the third term in the recursive sequence

$$a_{k+1} = 2a_k - 1, \text{ where } a_1 = 3.$$

- 5 Find the first four terms of the recursive sequence defined below.

$$a_1 = -3$$

$$a_n = a_{(n-1)} - n$$

- 2 What is the third term of the recursive sequence below?

$$a_1 = -6$$

$$a_n = \frac{1}{2}a_{n-1} - n$$

1) $-\frac{11}{2}$

2) $-\frac{5}{2}$

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

4) -4

- 6 Use the recursive sequence defined below to express the next three terms as fractions reduced to lowest terms.

$$a_1 = 2$$

$$a_n = 3(a_{n-1})^{-2}$$

- 3 What is the fourth term of the sequence defined by

$$a_1 = 3xy^5$$

$$a_n = \left(\frac{2x}{y}\right)a_{n-1}?$$

1) $12x^3y^3$

2) $24x^2y^4$

3) $24x^4y^2$

4) $48x^5y$

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Answer Section

1 ANS: 3 REF: 081520a2

2 ANS: 1

$$a_2 = \frac{1}{2}(-6) - 2 = -5$$

$$a_3 = \frac{1}{2}(-5) - 3 = -\frac{11}{2}$$

REF: 011623a2

3 ANS: 3

$$a_4 = 3xy^5 \left(\frac{2x}{y} \right)^3 = 3xy^5 \left(\frac{8x^3}{y^3} \right) = 24x^4y^2$$

REF: 061512a2

4 ANS:

$$a_1 = 3. \quad a_2 = 2(3) - 1 = 5. \quad a_3 = 2(5) - 1 = 9.$$

REF: 061233a2

5 ANS:

$$-3, -5, -8, -12$$

REF: fall0934a2

6 ANS:

$$a_2 = 3(2)^{-2} = \frac{3}{4} \quad a_3 = 3\left(\frac{3}{4}\right)^{-2} = \frac{16}{3} \quad a_4 = 3\left(\frac{16}{3}\right)^{-2} = \frac{27}{256}$$

REF: 011537a2