

Intro Homework

1. Look at the pattern, then write the next 2 terms in each of the following sequences.

a) 3, 9, 27, ...

b) 4, 8, 12, ...

c) 9, 3, 1, ...

d) 100, 95, 90, ...

e) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$

f) 5, 50, 500, ...

g) -2, -4, -6, ...

2. Determine the first 4 terms for each of the following sequences.

a) $t_n = 3n$

b) $t_n = n - 2$

c) $t_n = \frac{1}{n}$

d) $t_n = n^2 - 1$

e) $t_n = 3 - n$

f) $t_n = \frac{2n}{n+1}$

g) $t_n = 3n^2$

h) $t_n = 1 - n^3$

i) $t_n = 2n + 3$

j) $t_n = 3^{-n}$

3. Determine the first 4 terms for each of the following recursive sequences.

a) $t_n = t_{n-1} + 2$, where $t_1 = 5$

b) $t_n = 2t_{n-1}$, where $t_1 = -5$

c) $t_n = 6 - t_{n-1}$, where $t_1 = 3$

d) $t_n = (t_{n-1})^2$ where $t_1 = -1$

4. Determine a general term for each of the following sequences.

a) 2, 4, 6, 8, ...

b) 1, -1, 1, -1, ...

c) 2, 4, 8, 16, ...

d) 2, 8, 32, 128, ...

e) -2, -6, -18, -54, ...

f) $1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \dots$

5. Determine the first 6 terms of each of the following sequences.

a) $t_n = t_{n-1} + t_{n-2}$, where $t_1 = 1$ and $t_2 = 1, n \geq 3$

b) $t_n = t_{n-1} + 3t_{n-2}$, where $t_1 = 3$ and $t_2 = -2, n \geq 3$

Answers

1a) 81, 243

1c) $\frac{1}{3}, \frac{1}{9}$

1e) $\frac{1}{16}, \frac{1}{32}$

1g) -8, -10

2a) 3, 6, 9, 12

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

2e) 2, 1, 0, -1

2g) 3, 12, 27, 48

2i) 5, 7, 9, 11

3a) 5, 7, 9, 11

3c) 3, 3, 3, 3

4a) $t_n = 2n$

4c) $t_n = 2^n$

4e) $t_n = -2(3)^{n-1}$

5a) 1, 1, 2, 3, 5, 8

1b) 16, 20

1d) 85, 80

1f) 5000, 50 000

2b) -1, 0, 1, 2

2d) 0, 3, 8, 15

2f) $1, \frac{4}{3}, \frac{3}{2}, \frac{8}{5}$

2h) 0, -7, -26, -63

j) $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}$

3b) -5, -10, -20, -40

3d) -1, 1, 1, 1

4b) $t_n = (-1)^{n+1}$

4d) $t_n = 2^{2n-1}$

4f) $t_n = \frac{1}{n^2}$

5b) 3, -2, 7, 1, 22, 25