

COLLEGE ALGEBRA QUIZ

(1) Which of the following is true regarding sequences?

Solution: (a)

- (a) A sequence is a function.
- (b) A sequence is not a function.
- (c) All functions are sequences.
- (d) none of the above.

(2) Find the first four terms, a_{11} , and a_{15} .

Solution: (a)

$$a_n = (-1)^n \left(\frac{n^2}{n^4 + 2} \right).$$

- (a) $a_1 = -\frac{1}{3}$, $a_2 = \frac{2}{9}$, $a_3 = -\frac{9}{83}$, $a_4 = \frac{8}{129}$; $a_{11} = -\frac{121}{14,643}$; $a_{15} = -\frac{225}{50,627}$
- (b) $a_1 = -\frac{1}{2}$, $a_2 = \frac{4}{17}$, $a_3 = -\frac{9}{82}$, $a_4 = \frac{16}{257}$; $a_{11} = -\frac{121}{14,642}$; $a_{15} = -\frac{529}{279,842}$
- (c) $a_1 = -1$, $a_2 = 4$, $a_3 = -9$, $a_4 = 16$; $a_{11} = 100$; $a_{15} = -225$
- (d) $a_1 = 0$, $a_2 = \frac{3}{5}$, $a_3 = \frac{4}{5}$, $a_4 = \frac{15}{17}$; $a_{11} = \frac{99}{100}$; $a_{15} = \frac{112}{113}$

(3) Which of the following is the general, or n th, term?

$$3, 7, 11, 15, 19, \dots$$

Solution: (a)

- (a) $4n - 1$
- (b) $\frac{n}{n-1}$, $n \geq 2$
- (c) $n^2 - 1$
- (d) $\frac{n^2-1}{n^2+1}$

(4) Find and evaluate:

$$\sum_{k=1}^3 \frac{(-1)^{k+1} 4^k}{4^k - 1}$$

Solution: (a)

- (a) $\frac{4}{3} - \frac{16}{15} + \frac{64}{63} - \frac{256}{255} = \frac{1492}{5355}$
- (b) $\frac{3}{2} - \frac{9}{8} + \frac{27}{26} - \frac{81}{80} = \frac{417}{1040}$
- (c) $-\frac{4}{3} + \frac{16}{15} - \frac{64}{63} + \frac{256}{255} = -\frac{1492}{5355}$

$$(d) -\frac{3}{2} + \frac{9}{8} - \frac{27}{26} + \frac{81}{80} = -\frac{417}{1040}$$

(5) Which of the following is the given sum, in sigma notation?

$$2 + 5 + 10 + 17 + 26 + 37 + 50 + 65$$

Solution: (a)

(a) $\sum_{k=1}^8 (k^2 + 1)$

(b) $\sum_{k=1}^7 (-1)^k (k^2 - 1)$

(c) $\sum_{k=1}^8 (2k + 1)$

(d) $\sum_{k=1}^8 (2k - 1)$

(6) $a_n = 2n - 1$ is the general term of a sequence, which of the following is the graph of a_n ?

Solution: (a)

