

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Write out the first five terms of the sequence.

1) $\{s_n\} = \left\{ \frac{n}{n^2 + 2} \right\}$ 1) _____

A) $s_1 = \frac{1}{3}, s_2 = \frac{1}{3}, s_3 = \frac{3}{8}, s_4 = \frac{2}{5}, s_5 = \frac{5}{12}$

B) $s_1 = \frac{1}{2}, s_2 = \frac{1}{3}, s_3 = \frac{3}{8}, s_4 = \frac{2}{5}, s_5 = \frac{5}{12}$

C) $s_1 = \frac{1}{4}, s_2 = \frac{1}{3}, s_3 = \frac{3}{8}, s_4 = \frac{2}{5}, s_5 = \frac{5}{12}$

D) $s_1 = \frac{1}{3}, s_2 = \frac{1}{3}, s_3 = \frac{3}{11}, s_4 = \frac{2}{9}, s_5 = \frac{5}{27}$

The given pattern continues. Write down the nth term of the sequence $\{a_n\}$ suggested by the pattern.

2) $\frac{1}{1 \cdot 2}, \frac{1}{2 \cdot 3}, \frac{1}{3 \cdot 4}, \frac{1}{4 \cdot 5}, \dots$ 2) _____

A) $a_n = \frac{1}{1n}$

B) $a_n = \frac{1}{n \cdot 1n}$

C) $a_n = \frac{1}{n(n+1)}$

D) $n(n+1)$

Solve.

3) During a five-year period, a company doubles its profits each year. If the profits at the end of the fifth year are \$192,000, then what are the profits for each of the first four years? 3) _____

A) \$12,000, \$24,000, \$36,000, \$48,000

B) \$13,000, \$26,000, \$52,000, \$102,000

C) \$12,000, \$24,000, \$48,000, \$96,000

D) \$12,000, \$24,000, \$48,000, \$120,000

The sequence is defined recursively. Write the first four terms.

4) $a_1 = 6; a_n = \frac{a_n - 1}{n + 1}$ 4) _____

A) $a_1 = 6, a_2 = 6, a_3 = 2, a_4 = \frac{1}{2}$

B) $a_1 = 6, a_2 = 2, a_3 = \frac{1}{2}, a_4 = \frac{1}{10}$

C) $a_1 = 6, a_2 = 6, a_3 = 3, a_4 = 1$

D) $a_1 = 6, a_2 = 3, a_3 = 1, a_4 = \frac{1}{4}$

Express the sum using summation notation.

5) $3^2 + 6^3 + 9^4 + \dots + 24^9$ 5) _____

A) $\sum_{k=1}^8 (3k)^k$

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

C) $\sum_{k=1}^8 (3k)^{k+1}$

D) $\sum_{k=1}^8 3k2^k - 1$

Find the sum of the sequence.

6)

$$\sum_{k=1}^{10} 6$$

A) 60

B) 4

C) 10

D) 6

6) _____

7)

$$\sum_{k=2}^4 k(k-5)$$

A) -16

B) 3

C) -10

D) -20

7) _____

An arithmetic sequence is given. Find the common difference and write out the first four terms.

8) $\{s_n\} = \{3n + 7\}$

A) $d = 3; s_1 = 3, s_2 = 10, s_3 = 13, s_4 = 16$

B) $d = 7; s_1 = 3, s_2 = 10, s_3 = 13, s_4 = 16$

C) $d = 3; s_1 = 10, s_2 = 13, s_3 = 16, s_4 = 19$

D) $d = 7; s_1 = 10, s_2 = 13, s_3 = 16, s_4 = 19$

8) _____

Find the n th term and the indicated term of the arithmetic sequence $\{a_n\}$ whose initial term, a , and common difference, d , are given.

9) $a_1 = 9; d = -5$

$a_n = ?; a_{14} = ?$

A) $a_n = 14 - 5n; a_{14} = -26$

B) $a_n = 9 - 5n; a_{14} = -56$

C) $a_n = 14 + 5n; a_{14} = -56$

D) $a_n = 14 - 5n; a_{14} = -56$

9) _____

Find the first term, the common difference, and give a recursive formula for the arithmetic sequence.

10) 9th term is 56; 16th term is 28

A) $a_1 = 92, d = -4, a_n = a_{n-1} - 4$

B) $a_1 = 88, d = 4, a_n = a_{n-1} + 4$

C) $a_1 = 88, d = -4, a_n = a_{n-1} - 4$

D) $a_1 = 92, d = 4, a_n = a_{n-1} + 4$

10) _____

Find the sum.

11) $2 + 4 + 6 + \dots + 704$

A) 124,609

B) 124,256

C) 123,552

D) 123,904

11) _____

12) $\sum_{n=1}^{34} (-2n - 6)$

A) -1394

B) -1360

C) -1190

D) -1309

12) _____

Solve.

- 13) A local civic theater has 22 seats in the first row and 21 rows in all. Each successive row contains 3 additional seats. How many seats are in the civic theater? 13) _____
- A) 1070 seats B) 790 seats C) 1010 seats D) 1092 seats

Determine whether the given sequence is arithmetic, geometric, or neither. If the sequence is arithmetic, find the common difference; if it is geometric, find the common ratio.

- 14) 3, -9, 27, -81, 243, ... 14) _____
- A) Geometric; $r = 3$ B) Geometric; $r = -3$
C) Arithmetic; $d = -12$ D) Neither

- 15) $\{5n - 2\}$ 15) _____
- A) Geometric; $r = 5$ B) Arithmetic; $d = 5$
C) Arithmetic; $d = -2$ D) Neither

Find the fifth term and the n th term of the geometric sequence whose initial term, a , and common ratio, r , are given.

- 16) $a = 3$; $r = 4\pi$ 16) _____
- A) $a_5 = 768\pi$, $a_n = 3 \cdot 4^{n-1}\pi$ B) $a_5 = 3 + 16\pi$, $a_n = 3 + 4\pi(n-1)$
C) $a_5 = 3072\pi^5$, $a_n = 3 \cdot 4^n\pi^n$ D) $a_5 = 768\pi^4$, $a_n = 3 \cdot 4^{n-1}\pi^{n-1}$

Find the n th term $\{a_n\}$ of the geometric sequence. When given, r is the common ratio.

- 17) $3, -\frac{3}{2}, \frac{3}{4}, -\frac{3}{8}, \frac{3}{16}, \dots$ 17) _____
- A) $a_n = 3 \cdot \left(-\frac{1}{4}\right)^{n-1}$ B) $a_n = 3 \cdot \left(-\frac{1}{2}\right)^{n+1}$
C) $a_n = 3 \cdot \left(-\frac{1}{2}\right)^{n-1}$ D) $a_n = 3 \cdot \left(-\frac{1}{2}\right)^n$

Use a graphing utility to find the sum of the geometric sequence. Round answer to two decimal places, if necessary.

- 18) 18) _____
- $\sum_{k=1}^5 3(4)^k$
- A) 7710 B) 252 C) 4092 D) 268

Determine whether the infinite geometric series converges or diverges. If it converges, find its sum.

- 19) $3 + 7 + 9 + 11 + \dots$ 19) _____
- A) Converges; 22 B) Converges; ∞ C) Converges; 33 D) Diverges

20) $-12 - 3 - \frac{3}{4} - \dots$

20) _____

A) Converges; 4

B) Converges; - 16

C) Converges; $-\frac{63}{4}$

D) Diverges

Solve.

21) Lonnie deposits \$125 each month into an account paying annual interest of 5.5% compounded monthly. How much will his account have in it at the end of 11 years?

21) _____

A) \$1823

B) \$22,731

C) \$22,448

D) \$22,602

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use the Principle of Mathematical Induction to show that the statement is true for all natural numbers n.

22) $5 + 2 \cdot 5 + 3 \cdot 5 + \dots + 5n = \frac{5n(n+1)}{2}$

22) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Expand the expression using the Binomial Theorem.

23) $(x^2 - 4y)^4$

23) _____

A) $x^8 - 16x^6y + 96x^4y^2 - 256x^2y^3 + 256y^4$

B) $x^8 - 16x^6y + 96x^4y^2 + 16x^2y^3 + 256y^4$

C) $x^4 - 16x^3y + 96x^2y^2 - 256xy^3 + 256y^4$

D) $x^8 - 4x^6y + 96x^4y^2 - 128x^2y^3 + 256y^4$

Use the Binomial Theorem to find the indicated coefficient or term.

24) The 4th term in the expansion of $(4x + 2y)^{11}$

24) _____

A) $21,626,880x^3y^8$

B) $86,507,520x^8y^3$

C) $43,253,760x^8y^4$

D) $43,253,760x^3y^8$

25) The coefficient of x^4 in the expansion of $(3x + 4)^6$

25) _____

A) 19,440

B) 23,328

C) 34,560

D) 11,664

Answer Key

Testname: PRECAL REVIEW 4

- 1) D
- 2) C
- 3) C
- 4) B
- 5) C
- 6) A
- 7) A
- 8) C
- 9) D
- 10) C
- 11) B
- 12) A
- 13) D
- 14) B
- 15) B
- 16) D
- 17) C
- 18) C
- 19) D
- 20) B
- 21) D
- 22) Answers will vary.
- 23) A
- 24) B
- 25) A