

Pre Calc BC

Limits 'n' Series

Name _____

1. Two positive numbers, a and b , are in the sequence 4, a , b , 12. The first three numbers form a geometric sequence and the last three numbers form an arithmetic sequence. $b - a =$

- a) 1 b) $1\frac{1}{2}$ c) 2 d) $2\frac{1}{2}$ e) 3

2. What number should be added to each of the three numbers 3, 11, and 27 so that the resulting numbers form a geometric sequence

- a) 2 b) 3 c) 4 d) 5 e) 6

3. $\lim_{x \rightarrow a} \frac{2x^2 - 3ax + a^2}{x^2 - a^2} =$

- a) 1/2 b) 0 c) 3/2 d) a e) undefined

4. The 71'st term of 30, 27, 24, 21... is

- a) 180 b) -183 c) -180 d) 240 e) 5325

5. If a geometric sequence begins with the terms $\frac{1}{3}, 1, \dots$, what is the sum of the first 10 terms?

- a) $9841\frac{1}{3}$ b) $33\frac{1}{3}$ c) $3280\frac{1}{3}$
d) 6561 e) 6

6. $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x^2 - 4} =$

- a) 0 b) 2 c) 3 d) 1 e) ∞

7. If $x_0 = 1$ and $x_{n+1} = \sqrt[3]{2x_n}$, then $x_3 =$

- a) 1.260 b) 1.412 c) 1.361
d) 1.408 e) 1.396

8. The sum of all the numerical coefficients of $(x - y)^{17}$ is

- a) $\binom{17}{8}$ b) $2 \cdot \binom{17}{9}$ c) 1
d) 0 e) 17

9. Three consecutive terms of an arithmetic sequence are $x + \sqrt{2}$, $2x + \sqrt{3}$, and $5x - \sqrt{5}$. Then x equals

- a) 2.46 b) 3.56 c) 2.14
d) 2.45 e) 3.24

10. $\lim_{n \rightarrow \infty} (\sqrt[3]{3})(\sqrt[6]{3})(\sqrt[12]{3}) \dots (3 \cdot 2^n \sqrt[3]{3}) =$

- a) 2.3 b) 1.9 c) 2.2 d) 2.0 e) 2.1

11. An infinite geometric series begins with 2 and the sum approaches 3. What is the second term?

- a) 1/2 b) 1/3 c) 1/4 d) 1/6 e) 3/16

12. What is the value of $\sum_{n=0}^{\infty} \frac{2^n}{(n!)}$?

- a) 0 b) e^2 c) $2e$ d) 2^e e) ∞

13. What is $\left(\frac{\sqrt{3}}{2} + \frac{1}{2}i\right)^{120}$?

- a) 0 b) i c) 1 d) $-i$ e) $1 + i$