

Directions: Remember to show your work.

1. Write the first five terms of the sequence:

$$a_n = n^2 + 10$$

Tell whether the sequence is arithmetic, geometric or neither and briefly explain your reasoning.

2. 375, 75, 15,  $3, \frac{3}{5}, \dots$

3. 3, 10, 29, 66, 127, 218, ...

4. 12, 6, 0, -6, -12, ...

For the sequences below, first write a rule, then find the fifteenth term and the sum of the first 15 terms.

5. 5, 8, 11, 14, 17, ...

6. 5, 10, 20, 40, 80, ...

7. Find a rule for  $a_n$  for the arithmetic sequence, given  $a_3 = 17$  and  $a_{12} = 62$ .

8. Find a rule for  $a_n$  for the geometric sequence with  $a_3 = 15$  and  $a_6 = 405$ .

**Answers:**

1. \_\_\_\_\_

2. \_\_\_\_\_

See problem for

explanation

3. \_\_\_\_\_

See problem for

explanation

4. \_\_\_\_\_

See problem for

explanation

5.  $a_n =$  \_\_\_\_\_

$a_{15} =$  \_\_\_\_\_

$S_{15} =$  \_\_\_\_\_

6.  $a_n =$  \_\_\_\_\_

$a_{15} =$  \_\_\_\_\_

$S_{15} =$  \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

For problems 9-13, find the sum, if possible.

9. 
$$\sum_{n=1}^4 (n^3 - 1)$$

10. 
$$\sum_{n=1}^{35} 5n - 48$$

**Answers:**

9. \_\_\_\_\_

10. \_\_\_\_\_

11. 
$$\sum_{n=1}^{10} 2(3)^{n-1}$$

12. 
$$\sum_{n=1}^{\infty} 3\left(\frac{1}{6}\right)^{n-1}$$

11. \_\_\_\_\_

12. \_\_\_\_\_

13. 
$$\sum_{n=1}^{\infty} 4(5)^{n-1}$$

13. \_\_\_\_\_

14. \_\_\_\_\_

Write the repeating decimal as a fraction in lowest terms.

14. 0.4444444 ...

15. 0.15151515 ...

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

16. An auditorium with 50 rows has 35 seats in the first row. If every row after the first row has 2 more seats than the row in front of it, how many seats are in the auditorium altogether?

17. A pendulum is released to swing freely. On the 1<sup>st</sup> swing, it travels a distance of 24 cm. On each successive swing, the pendulum travels  $\frac{4}{5}$  of the previous swing. What is the total distance the pendulum swings?