

Sequence and Series Test **Review**

Generate the first five terms in the sequence using the explicit formula.

1. $y_n = -5n - 5$
 $-5(1) - 5 = -10$
 $-5(2) - 5 = -15$

$-10, -15, -20, -25, -30$

2. What is the 15th term in the sequence using the given formula?

$c_n = 3n - 1$

$3(15) - 1 = 44$

D 3. Write an explicit formula for the sequence 8, 6, 4, 2, 0, ... Then find a_{14} .

a. $a_n = -2n + 10; -16$

~~b. $a_n = -2n + 8; -18$~~

~~c. $a_n = -2n + 8; -20$~~

d. $a_n = -2n + 10; -18$

$-2(1) + 8 = 6$

$-2(14) + 10$

$-28 + 10$

4. Suppose you drop a tennis ball from a height of 8 feet. After the ball hits the floor, it rebounds to 80% of its previous height. How high will the ball rebound after its third bounce? Round to the nearest tenth.

$$80\% = .8 \quad 8, 6.4, \dots, \overline{\quad}$$

$n = 4$

$$a_n = a_1 (r)^{n-1}$$
$$= 8 (.8)^3$$

$$a_4 = 4.1 \text{ ft}$$

Is the sequence arithmetic? If so, identify the common difference.

5. 13, 20, 27, 34, ... yes, $d = 7$

6. 14, 21, 42, 77, ... no

7. Find the missing term of the arithmetic sequence 26, , 18, ... $\frac{26+18}{2}$
22

A

8. Viola makes gift baskets for Valentine's Day. She has 13 baskets left over from last year, and she plans to make 12 more each day. If there are 15 work days until the day she begins to sell the baskets, how many baskets will she have to sell?

- a. 193 baskets c. 205 baskets
b. 156 baskets d. 181 baskets

$$15(12) + 13$$

Is the sequence geometric? If so, identify the common ratio.

9. 6, 12, 24, 48, ... yes $r=2$
10. 2, -4, -16, -36, ... no

What is the fifth term of the geometric sequence?

11. 5, 15, 45, ... 135 (405)
- $r=3$

Write the explicit formula for the geometric sequence. Then find the fifth term in the sequence.

12. $a_1 = -4, a_2 = 8, a_3 = -16$
- $r = -2$
- $a_5 = -4(-2)^4$
- $= -4(16) = -64$
- $a_n = a_1(r)^{n-1}$
- $a_n = -4(-2)^{n-1}$

A

13. Kaylee is painting a design on the floor of a recreation room using equilateral triangles. She begins by painting the outline of Triangle 1 measuring 50 inches on a side. Next, she paints the outline of Triangle 2 inside the first triangle. The side length of Triangle 2 is 80% of the length of Triangle 1. She continues painting triangles inside triangles using the 80% reduction factor. Which triangle will first have a side length of less than 29 inches?

- a. Triangle 4
 b. Triangle 3
 c. Triangle 5
 d. Triangle 6

50, 40, 32, 25.6

$$80\% = .8$$

What is a possible value for the missing term of the geometric sequence?

14. 43, ___, 688, ...

$$\sqrt{43 \cdot 688} = \sqrt{29864} = 172$$

What is the sum of the finite arithmetic series?

15. $29 + 32 + 35 + 38 + 41 + \dots + 59$

$$n = 11$$

$$s_n = \frac{n}{2} (a_1 + a_n)$$

$$\frac{11}{2} (29 + 59)$$

$$5.5 (88) = 484$$

16. A large asteroid crashed into a moon of a planet, causing several boulders from the moon to be propelled into space toward the planet. Astronomers were able to measure the speed of one of the projectiles. The distance (in feet) that the projectile traveled each second, starting with the first second, was given by the arithmetic sequence 26, 44, 62, 80, ... Find the total distance that the projectile traveled in seven seconds.
- a. 534 feet **b. 560 feet** c. 212 feet d. 426 feet

$d = 18$

$a_n = 26 + (n-1)(18)$

$a_7 = 134$

$3.5(160)$

$\frac{7}{2}(26 + 134)$

$= 560$

C

17. Use summation notation to write the series $49 + 54 + 59 + \dots$ for 14 terms.

~~a. $\sum_{n=1}^{14} (49 + 5n)$~~

~~b. $\sum_{n=1}^{13} (44 + 5n)$~~

a_1

c. $\sum_{n=1}^{14} (44 + 5n)$

~~d. $\sum_{n=1}^{44} (49 + 5n)$~~

$49 + 5(1) = 54$

e. $44 + 5(1) = 49$

18. Evaluate the series $\sum_{n=3}^8 5n$.

$$\frac{6}{2}(15+40)$$

$$3(55) = 165$$

$$a_3 = 5(3) = 15$$

$$a_8 = 5(8) = 40$$

$$n = 8 - 3 + 1 = 6$$

19. Find the sum of the finite geometric series. $1 + 4 + 16 + 64 + 256 + 1024$.

$$n = 6$$

$$\frac{a_1(1-r^n)}{1-r} = \frac{1(1-4^6)}{1-4} = \frac{1(-4096)}{-3}$$

$$r = 4$$

$$\frac{1(-4096)}{-3} = 1365$$

D 20. In June, Cory begins to save money for a video game and a TV he wants to buy in December. He starts with \$20. Each month he plans to save 10% more than the previous month. How much money will he have at the end of December?

a. \$154.31

b. \$251.59

c. \$228.72

d. \$189.74

$$a_1 = 20$$

$$r = 1.1$$

$$n = 7$$

$$\frac{20(1-1.1^7)}{1-1.1} = \frac{20(-.9487171)}{-0.1} = 189.74$$