Name: Solutions

Quiz 2: HSF-BF.A.2 Identify and use sequences

Identify arithmetic and geometric sequences

Circle whether the sequence is arithmetic, geometric, or neither.

1. $2, 4, 6, 8, \ldots$ $d = +2$
   arithmetic, geometric, neither
2. $1, 2, 4, 7, 11, \ldots$
   arithmetic, geometric, neither
3. $3, 6, 12, 24, \ldots$ $r = *2$
   arithmetic, geometric, neither
4. $13, 10, 7, 4, 1, \ldots$ $d = -3$
   arithmetic, geometric, neither
5. $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \ldots$ $r = \frac{1}{2}$
   arithmetic, geometric, neither

Write recursive formulas

6. Write a recursive formula for the sequence $5, 10, 15, 20, \ldots$

$$f(1) = 5$$
$$f(n) = f(n-1) + 5 \qquad n \geq 2$$

7. Write a recursive formula for the sequence $3, 9, 27, 81, \ldots$

$$f(1) = 3$$
$$f(n) = f(n-1) * 3 \qquad n \geq 2$$

Apply sequences as models

8. A metal sculture is made from welded steel rods. The first rod is 3 feet long. Each successive rod is 80% of the length of the previous rod. Indicate whether each formula correctly defines the length $L(n)$ of the nth rod by circling True or False.

a. $L(n) = 3(0.8)^n$
True, False

b. $L(n) = 3(0.8)^{n-1}$
True, False

c. $L(n) = 3 - 0.20n$
True, False

d. $L(1) = 3$
$L(n) = L(n-1)(0.8)$
True, False

$$f(1) = 3$$
$$f(n) = f(n-1) \times 0.80 \qquad n \geq 2$$
or
$$L(n) = 3 * (0.80)^{(n-1)} \qquad n \geq 1$$

Fractions, percent, decimals (7-NS)

Write each fraction as a percent and as a decimal.

9. $\frac{1}{4}$ 25% 0.25

10. $\frac{1}{2}$ 50% 0.5

11. $\frac{1}{3}$ $33\frac{1}{3}\%$ $0.\overline{3}$

Write each percent as a fraction in simplest terms.

12. 75% 3/4

13. $66\frac{2}{3}\%$ 2/3

14. 150% $1\frac{1}{2}$ or $\frac{3}{2}$

Operations on fractions

15. $\frac{1}{2} + \frac{1}{3} =$ 5/6

16. $\frac{1}{2} - \frac{1}{3} =$ 1/6

17. $\frac{3}{2} \times \frac{1}{3} =$ 1/2

18. $\frac{1}{2} \div \frac{2}{3} =$ 3/4

Use standard algebraic function notation

19. Given the arithmetic sequence $f(n)$ whose first two terms are 4 and 9.
    a. Write down $f(2)$
    b. Write down the value of the common difference d
    c. Find $f(3)$
    d. Write and equation relating $f(5)$ and $f(6)$

a) $f(2) = 9$

b) $d = 9 - 4 = 5$

c) $f(3) = 9 + 5 = 14$

d) $f(6) = f(5) + 5$

20. Given the geometric sequence $g(n)$ whose first term is 3 with a growth rate of $r = 2$.
    a. Find the second term $g(2)$.
    b. State the value of the first term using function notation in an equation.
    c. Define g recursively using function notation. (There should be two equations)
    d. Write down the value of $\frac{g(7)}{g(6)}$.

a) $g(2) = 3 \cdot 2 = 6$

b) $g(1) = 3$

c) $g(1) = 3$
$g(n) = g(n-1) \cdot 2$

d) $\frac{g(7)}{g(6)} = 2$

21. A sequence is defined recursively as
    $f(1) = 2$
    $f(n) = f(n-1) \times 5$
    a. Is the sequence arithmetic, geometric, or neither?
    b. Find the value of $f(3)$.

2, 10, 50

b) $f(3) = 50$

BECA / Huson / Algebra 2 Unit 1 Sequences (9.3)
29 September 2023

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Quiz 2: HSF-BF.A.2 Identify and use sequences

Identify arithmetic and geometric sequences

Circle whether the sequence is arithmetic, geometric, or neither.

1. $2, 4, 8, 16, \ldots$
   arithmetic, geometric, neither
   $r = 2$
2. $1, 3, 5, 7, \ldots$
   arithmetic, geometric, neither
   $d = 2$
3. $-10, -5, 0, 5, \ldots$
   arithmetic, geometric, neither
   $d = 5$
4. $10, 9, 7, 4, \ldots$
   arithmetic, geometric, neither
5. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \ldots$
   arithmetic, geometric, neither

Write recursive formulas

6. Write a recursive formula for the sequence $1, 5, 25, 125, \ldots$

$f(1) = 1$
$f(n) = f(n-1) \times 5 \quad n \geq 2$

7. Write a recursive formula for the sequence $3, 9, 15, 21, \ldots$

$f(1) = 3$
$f(n) = f(n-1) + 6 \quad n \geq 2$

Apply sequences as models

8. A metal sculture is made from welded steel rods. The first rod is 3 feet long. Each successive rod is 80% of the length of the previous rod. Indicate whether each formula correctly defines the length $L(n)$ of the nth rod by circling True or False.

a. $L(n) = 3 - 0.80(n-1)$ $n \geq 1$
True, False
b. $L(n) = 3(0.8)^n$ $n \geq 1$
True, False
c. $L(n) = 3(0.8)^{n-1}$ $n \geq 1$
True, False
d. $L(1) = 3$
$L(n) = L(n-1) \times (0.8)$ $n \geq 1$
True, False

$L(1) = 3$
$L(n) = L(n-1) \times 0.8$
or
$L(n) = 3 \cdot (0.8)^{n-1}$