

F.IF.A.3: Sequences 1

- 1 Given the following three sequences:
I. 2, 4, 6, 8, 10...
II. 2, 4, 8, 16, 32...
III. $a, a + 2, a + 4, a + 6, a + 8, \dots$
Which ones are arithmetic sequences?
1) I and II, only
2) I and III, only
3) II and III, only
4) I, II, and III
- 2 What is the common difference of the arithmetic sequence 5, 8, 11, 14?
1) $\frac{8}{5}$
2) -3
3) 3
4) 9
- 3 The first term in a sequence is 5 and the fifth term is 17. What is the common difference?
1) 2.4
2) 12
3) 3
4) 4
- 4 Determine the common difference of the arithmetic sequence in which $a_1 = 3$ and $a_4 = 15$.
- 5 Find the common difference in the arithmetic sequence, a_n , in which $a_1 = 16$ and $a_9 = 36$.
- 6 What is the common difference of the arithmetic sequence below?
 $-7x, -4x, -x, 2x, 5x, \dots$
1) -3
2) $-3x$
3) 3
4) $3x$
- 7 What is the common difference in the sequence $2a + 1, 4a + 4, 6a + 7, 8a + 10, \dots$?
1) $2a + 3$
2) $-2a - 3$
3) $2a + 5$
4) $-2a + 5$
- 8 Given the sequence: $x, (x + y), (x + 2y), \dots$
Which expression can be used to determine the common difference of this sequence?
1) $x - (x + y)$
2) $(x + 2y) - (x + y)$
3) $\frac{x}{(x + y)}$
4) $\frac{(x + 2y)}{(x + y)}$
- 9 Which arithmetic sequence has a common difference of 4?
1) $\{0, 4n, 8n, 12n, \dots\}$
2) $\{n, 4n, 16n, 64n, \dots\}$
3) $\{n + 1, n + 5, n + 9, n + 13, \dots\}$
4) $\{n + 4, n + 16, n + 64, n + 256, \dots\}$
- 10 Consider the following patterns:
I. 16, $-12, 9, -6.75, \dots$
II. 1, 4, 9, 16, \dots
III. 6, 18, 30, 42, \dots
IV. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \dots$
Which pattern is geometric?
1) I
2) II
3) III
4) IV

- 11 Which situation could be modeled using a geometric sequence?
- 1) A cell phone company charges \$30.00 per month for 2 gigabytes of data and \$12.50 for each additional gigabyte of data.
 - 2) The temperature in your car is 79° . You lower the temperature of your air conditioning by 2° every 3 minutes in order to find a comfortable temperature.
 - 3) David's parents have set a limit of 50 minutes per week that he may play online games during the school year. However, they will increase his time by 5% per week for the next ten weeks.
 - 4) Sarah has \$100.00 in her piggy bank and saves an additional \$15.00 each week.
- 12 Determine and state whether the sequence $1, 3, 9, 27, \dots$ displays exponential behavior. Explain how you arrived at your decision.
- 13 What is the common ratio of the geometric sequence shown below?
 $-2, 4, -8, 16, \dots$
- 1) $-\frac{1}{2}$
 - 2) 2
 - 3) -2
 - 4) -6
- 14 The common ratio of the sequence $-\frac{1}{2}, \frac{3}{4}, -\frac{9}{8}$ is
- 1) $-\frac{3}{2}$
 - 2) $-\frac{2}{3}$
 - 3) $-\frac{1}{2}$
 - 4) $-\frac{1}{4}$
- 15 If $x \neq 0$, then the common ratio of the sequence $x, 2x^2, 4x^3, 8x^4, 16x^5, \dots$ is
- 1) $2x$
 - 2) 2
 - 3) x
 - 4) $\frac{1}{2}x$
- 16 What is the common ratio of the sequence $\frac{1}{64}a^5b^3, -\frac{3}{32}a^3b^4, \frac{9}{16}ab^5, \dots$?
- 1) $-\frac{3b}{2a^2}$
 - 2) $-\frac{6b}{a^2}$
 - 3) $-\frac{3a^2}{b}$
 - 4) $-\frac{6a^2}{b}$
- 17 What is a common ratio of the geometric sequence whose first term is 5 and third term is 245?
- 1) 7
 - 2) 49
 - 3) 120
 - 4) 240
- 18 What is the common ratio of the geometric sequence whose first term is 27 and fourth term is 64?
- 1) $\frac{3}{4}$
 - 2) $\frac{64}{81}$
 - 3) $\frac{4}{3}$
 - 4) $\frac{37}{3}$

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Answer Section

1 ANS: 2 REF: 061919ai

2 ANS: 3 REF: 061001a2

3 ANS: 3

$$\frac{17-5}{5-1} = \frac{12}{4} = 3$$

REF: 062215ai

4 ANS:

$$\frac{15-3}{4-1} = \frac{12}{3} = 4$$

REF: 012328ai

5 ANS:

$$\frac{36-16}{9-1} = \frac{20}{8} = 2.5$$

REF: 081630a2

6 ANS: 4 REF: 061411a2

7 ANS: 1

$$(4a+4)-(2a+1) = 2a+3$$

REF: 011401a2

8 ANS: 2 REF: 011610a2

9 ANS: 3 REF: 011110a2

10 ANS: 1

$$\frac{-12}{16} = \frac{9}{-12} = \frac{-6.75}{9}$$

REF: 012017aii

11 ANS: 3 REF: 061910aii

12 ANS:

Yes, because the sequence has a common ratio, 3.

REF: 081726ai

13 ANS: 3

$$\frac{4}{-2} = -2$$

REF: 011304a2

14 ANS: 1

$$\frac{\frac{3}{4}}{-\frac{1}{2}} = -\frac{3}{2}$$

REF: 011508a2

15 ANS: 1

$$\frac{2x^2}{x} = 2x$$

REF: 082202ai

16 ANS: 2

$$\frac{-\frac{3}{32}a^3b^4}{\frac{1}{64}a^5b^3} = -\frac{6b}{a^2}$$

REF: 061326a2

17 ANS: 1

$$5r = a_2 \quad a_2 r = 245 \quad 5r = \frac{245}{r}$$

$$a_2 = \frac{245}{r} \quad 5r^2 = 245$$

$$r^2 = 49$$

$$r = \pm 7$$

REF: 081924ai

18 ANS: 3

$$27r^{4-1} = 64$$

$$r^3 = \frac{64}{27}$$

$$r = \frac{4}{3}$$

REF: 081025a2