

Precalculus - Sequences and Series - Test Answer Key

Common Core F-IF.A.3, F-BF.A.2, A-SSE.B.4 · maths-pdf.fr/en/

Worked solutions and scoring notes for the 9-question sequences and series test. Use the scoring line under each solution to award partial credit.

Precalculus · Common Core State Standards: **F-IF.A.3, F-BF.A.2, A-SSE.B.4**

Question 1 - Arithmetic terms [2 pts]

$$-2, 3, 8, 13. a_{15} = -2 + 5(14) = 68.$$

$$-2, 3, 8, 13; a_{15} = 68$$

Scoring: 1 point for the terms, 1 point for a_{15} .

Question 2 - Geometric term [2 pts]

$$a_6 = 5(-2)^5 = 5(-32).$$

$$-160$$

Scoring: 1 point for the formula, 1 point for the value.

Question 3 - Recursive to explicit [2 pts]

$$\text{Arithmetic with } d = -3: a_n = 7 - 3(n-1) = 10 - 3n.$$

$$a_n = 10 - 3n$$

Scoring: 1 point for d , 1 point for the formula.

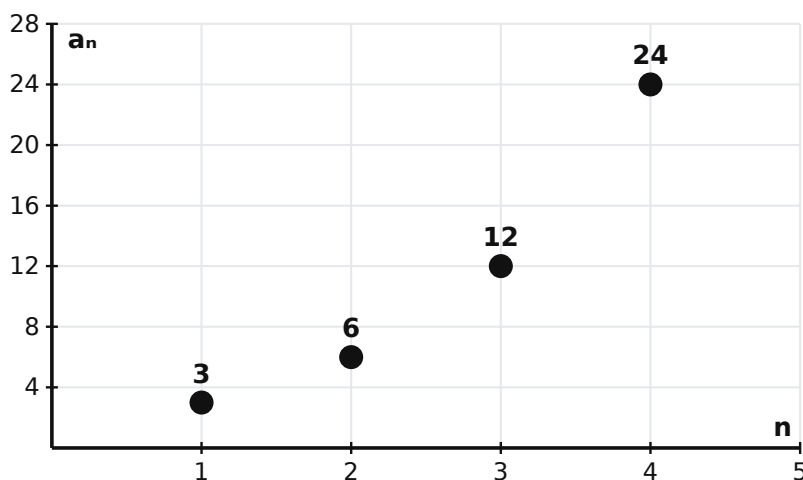
Question 4 - Arithmetic sum [2 pts]

$$a_{25} = 4 + 24(3) = 76. S_{25} = \frac{25}{2}(4 + 76) = 1000.$$

1000

Scoring: 1 point for a_{25} , 1 point for the sum.

Question 5 - Read a sequence graph [3 pts]



Ratio 2.

(a) $\frac{6}{3} = \frac{12}{6} = 2$. (b) $a_n = 3 \cdot 2^{n-1}$. (c) $3 \cdot 2^7 = 384$.

2; $a_n = 3 \cdot 2^{n-1}$; 384

Scoring: 1 point for each part.

Question 6 - Sigma notation [2 pts]

$$a_1 = 4, r = \frac{1}{2}, n = 5. S_5 = 4 \cdot \frac{1 - \frac{1}{32}}{\frac{1}{2}} = 8 \cdot \frac{31}{32} = \frac{31}{4}.$$

$$\frac{31}{4} = 7.75$$

Scoring: 1 point for the setup, 1 point for the value.

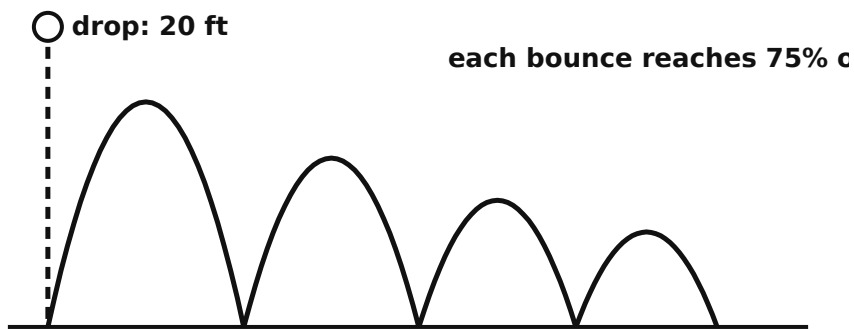
Question 7 - Infinite series [2 pts]

$$|r| < 1. S = \frac{12}{1 - \frac{1}{3}} = \frac{12}{\frac{2}{3}} = 18.$$

18

Scoring: 1 point for checking $|r| < 1$, 1 point for the sum.

Question 8 - Bouncing ball [3 pts]



Rebound heights 15, 11.25, 8.4375.

(a) $20(0.75)^3 = 8.4375$ ft. (b) Up-heights: $\frac{15}{1-0.75} = 60$. Total = $20 + 2(60) = 140$ ft.

8.4375 ft; 140 ft

Scoring: 1 point for (a), 2 points for (b).

Question 9 - Repeating decimal [2 pts]

$0.27 + 0.0027 + \dots$: $a_1 = 0.27$, $r = 0.01$. $S = \frac{0.27}{0.99} = \frac{27}{99} = \frac{3}{11}$.

$\frac{3}{11}$

Scoring: 1 point for the series, 1 point for the fraction.

Total

20 points