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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

10701

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(1, \sqrt{2})

(\frac{1}{2}, \frac{\sqrt{3}}{2})

۳ = ۷۷ خزانة سوال

2

$$2 = 1 + 1$$

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$$a_1 = a_1 + 3a_1 = \frac{1}{3} + \frac{1}{3} \times \frac{1}{3} = \frac{4}{9}$$

$$\left. \begin{aligned} a_n &= 4, 7, 10, \dots \\ b_n &= 2, 5, 8, \dots \end{aligned} \right\} \begin{aligned} &\text{اولی و دومین جمله مشترک} \\ &a_n, b_n \end{aligned} \quad (2)$$

$$a_n = 3n + 1, \quad b_n = 3n - 1 \quad \text{مشترک } a_n \text{ و } b_n = 4n - 1$$

چون جمله a_n به از جمله دوم کوچکتر از b_n پس جمله مشترک در جمله اول

$$a_{40} > 4n - 1 \quad \text{کوچکتر از } a_{40} \text{ یا مساوی آن}$$

$$4 \times 40 + 1 > 4n - 1$$

$$161 > 4n - 1 \Rightarrow 4n < 162 \Rightarrow n < 40.5 \quad \text{✓ جمله مشترک}$$

$$a_1 + a_7 + a_9 = 21 \Rightarrow 3a_1 + 3d = 21 \Rightarrow \underbrace{a_1 + d}_{a_7} = 7 \quad (1, 5) \quad \checkmark$$

$$a_1 + a_7 + a_9 = 10d \Rightarrow 3a_1 + 4d = 10d \Rightarrow \underbrace{a_1 + 2d}_{a_9} = 3d \quad \checkmark$$

$$a_n = a_1, \quad a_7, \dots = a_1, \quad 7, 3d, \dots \Rightarrow a_1 = -21$$

دقت! $\begin{matrix} \uparrow & \uparrow \\ 7 & 3 \end{matrix}$

$$\text{فراستة سوال: } \frac{a^3 - a^2 + a_1}{a_1} = \frac{7}{-21} = \left[\frac{-1}{3} \right]$$

$$a_7 - a_9 + a_1 = 3d - 3d + (-21) = -21 \quad \checkmark$$

$$a_1 + a_7 + a_9 = 10d \Rightarrow 3a_1 + 4d = 10d \Rightarrow (a_1 + d = 0) \times 2 \quad (1) \quad \checkmark$$

$$a_7 + a_9 = 2a_1 + 3d = 2d \rightarrow 2a_1 + 3d = 2d$$

$$3d = 2d \Rightarrow d = 0 \quad \checkmark$$

$$a_{10} = a_1 + 9d = -21 + 9 \times 0 = -21 \quad \checkmark$$

$$S_9 = 9S_7 \Rightarrow \left(\frac{2a_1 + 1d}{2} \right) \times 9 = 9 \left(\frac{2a_1 + 2d}{2} \right) \times 7 \quad (2) \quad (9) \quad \checkmark$$

$$\Rightarrow (a_1 + 4d) \times 9 = (a_1 + d) \times 14 \Rightarrow 9a_1 + 36d = 14a_1 + 14d$$

$$\Rightarrow 11a_1 = 22d \Rightarrow 2a_1 = d$$

$$\frac{a_{40}}{a_7} = \frac{a_1 + 19d}{a_1 + 4d} = \frac{29a_1}{11a_1} = \frac{29}{11} \quad \checkmark$$

$$a_1 = 11, a_v = \omega$$

(2)

(19)

$$t_n = \omega 1, \dots, 1\omega$$

$$a_k = \frac{a_1 + a_v}{\omega} = \frac{\omega + 11}{\omega} = \omega$$

$$a_k = t_k \Rightarrow \omega = t_k = t_1 + \omega d = \omega 1 + \omega d \Rightarrow \omega d = -1d \Rightarrow d = -1$$

$$\text{قادر واسطه} = \frac{1\omega - \omega 1}{-1} - 1 = \omega \checkmark$$

$$a_{14}, a_{10}, a_{11}, a_{12} \leftarrow \text{قسم 2, 2} \quad \text{ب. 2}$$

$$a_{14} + a_{12} = a_{10} + a_{11} \xrightarrow{\text{مجموع 2}} 2(a_{10} + a_{11}) = 2(248) = \boxed{496}$$

$$a_{10} + a_{11} = a_1 + a_4 = 2a_1 + 29d = 248 \quad \uparrow$$