

# HW Answers Unit 4 Lesson 2 p. 635 #1 – 43, 59 – 71, 83 - 87 ODD

## Solutions to Odd-Numbered Exercises

1. 10, 8, 6, 4, 2, ...

Arithmetic sequence,  $d = -2$

5. -24, -16, -8, 0, 8

Arithmetic sequence,  $d = 8$

9.  $a_n = 8 + 13n$

21, 34, 47, 60, 73

Arithmetic sequence,  $d = 13$

13.  $a_n = 150 - 7n$

143, 136, 129, 122, 115

Arithmetic sequence,  $d = -7$

17.  $a_1 = 15, a_{k+1} = a_k + 9$

$$a_2 = 15 + 9 = 24$$

$$a_3 = 24 + 9 = 33$$

$$a_4 = 33 + 9 = 42$$

$$a_5 = 42 + 9 = 51$$

$$d = 9, a_n = 6 + 9n$$

21.  $a_1 = 5, d = 6$

$$a_1 = 5$$

$$a_2 = 5 + 6 = 11$$

$$a_3 = 11 + 6 = 17$$

$$a_4 = 17 + 6 = 23$$

$$a_5 = 23 + 6 = 29$$

3.  $3, \frac{5}{2}, 2, \frac{3}{2}, 1, \dots$

Arithmetic sequence,  $d = -\frac{1}{2}$

7. 3.7, 4.3, 4.9, 5.5, 6.1, ...

Arithmetic sequence,  $d = 0.6$

11.  $a_n = \frac{1}{n+1}$

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}$$

Not an arithmetic sequence

15.  $a_n = 3 + \frac{(-1)^{n2}}{n}$

$$1, 4, \frac{7}{3}, \frac{7}{2}, \frac{13}{5}$$

Not an arithmetic sequence

19.  $a_1 = \frac{7}{2}, a_{k+1} = a_k - \frac{1}{4}$

$$a_2 = \frac{7}{2} - \frac{1}{4} = \frac{13}{4}$$

$$a_3 = \frac{13}{4} - \frac{1}{4} = \frac{12}{4} = 3$$

$$a_4 = \frac{12}{4} - \frac{1}{4} = \frac{11}{4}$$

$$a_5 = \frac{11}{4} - \frac{1}{4} = \frac{10}{4} = \frac{5}{2}$$

$$d = -\frac{1}{4}, a_n = \frac{15}{4} - \frac{1}{4}n$$

23.  $a_1 = -2.6, d = -0.4$

$$a_1 = -2.6$$

$$a_2 = -2.6 + (-0.4) = -3.0$$

$$a_3 = -3.0 + (-0.4) = -3.4$$

$$a_4 = -3.4 + (-0.4) = -3.8$$

$$a_5 = -3.8 + (-0.4) = -4.2$$

25.  $a_8 = 26, a_{12} = 42$

$$26 = a_8 = a_1 + (n-1)d = a_1 + 7d$$

$$42 = a_{12} = a_1 + (n-1)d = a_1 + 11d$$

Answer:  $d = 4, a_1 = -2$

$$a_1 = -2$$

$$a_2 = -2 + 4 = 2$$

$$a_3 = 2 + 4 = 6$$

$$a_4 = 6 + 4 = 10$$

$$a_5 = 10 + 4 = 14$$

29.  $a_1 = 5, a_2 = 11 \Rightarrow d = 6$

$$a_{10} = a_1 + 9d = 5 + 9(6) = 59$$

33.  $a_1 = 4.2, a_2 = 6.6 \Rightarrow d = 2.4$

$$a_7 = a_1 + 6d = 4.2 + 6(2.4) = 18.6$$

37.  $a_1 = 100, d = -8$

$$a_n = a_1 + (n-1)d = 100 + (n-1)(-8) = 108 - 8n$$

39.  $4, \frac{3}{2}, -1, -\frac{7}{2}, \dots$

$$d = -\frac{5}{2}$$

$$a_n = a_1 + (n-1)d = 4 + (n-1)\left(-\frac{5}{2}\right) = \frac{13}{2} - \frac{5}{2}n$$

41.  $a_1 = 5, a_4 = 15$

$$a_4 = a_1 + 3d \Rightarrow 15 = 5 + 3d \Rightarrow d = \frac{10}{3}$$

$$a_n = a_1 + (n-1)d = 5 + (n-1)\left(\frac{10}{3}\right) = \frac{10}{3}n + \frac{5}{3}$$

43.  $a_3 = 94, a_6 = 85$

$$a_6 = a_3 + 3d \Rightarrow 85 = 94 + 3d \Rightarrow d = -3$$

$$a_1 = a_3 - 2d \Rightarrow a_1 = 94 - 2(-3) = 100$$

$$a_n = a_1 + (n-1)d = 100 + (n-1)(-3) = 103 - 3n$$

59.  $a_1 = 8, a_2 = 26 \Rightarrow d = 18$

$$a_{10} = a_1 + 9d = 8 + 9(18) = 170$$

$$S_{10} = \frac{10}{2}(a_1 + a_{10}) = 5(8 + 170) = 890$$

63.  $a_1 = 100, a_{25} = 220$

$$a_{25} = a_1 + 24d \Rightarrow d = 5$$

$$S_{25} = \frac{25}{2}(a_1 + a_{25}) = 12.5(100 + 220) = 4000$$

67.  $a_1 = 5, a_{100} = 500, n = 100$

$$\sum_{n=1}^{100} 5n = \frac{100}{2}(5 + 500) = 25,250$$

27.  $a_3 = 19, a_{15} = -1.7$

$$a_{15} = a_3 + 12d$$

$$-1.7 = 19 + 12d \Rightarrow d = -1.725$$

$$a_3 = a_1 + 2d \Rightarrow 19 = a_1 + 2(-1.725) \Rightarrow a_1 = 22.45$$

$$a_2 = a_1 - 1.725 = 20.725$$

$$a_3 = 19$$

$$a_4 = 19 - 1.725 = 17.275$$

$$a_5 = 17.275 - 1.725 = 15.55$$

31.  $a_1 = 2, a_2 = -2 \Rightarrow d = -4$

$$a_{14} = a_1 + 13d = 2 + 13(-4) = -50$$

35.  $a_1 = 1, d = 3$

$$a_n = a_1 + (n-1)d = 1 + (n-1)(3) = 3n - 2$$

61.  $a_1 = 0.5, a_2 = 1.3 \Rightarrow d = 0.8$

$$a_{10} = a_1 + 9d = 0.5 + 9(0.8) = 7.7$$

$$S_{10} = \frac{10}{2}(a_1 + a_{10}) = 5(0.5 + 7.7) = 41$$

65.  $a_1 = 1, a_{50} = 50, n = 50$

$$\sum_{n=1}^{50} n = \frac{50}{2}(1 + 50) = 1275$$

69.  $\sum_{n=11}^{30} n - \sum_{n=1}^{10} n = \frac{20}{2}(11 + 30) - \frac{10}{2}(1 + 10) = 355$

71.  $a_1 = 4, a_{500} = 503, n = 500$

$$\sum_{n=1}^{500} (n + 3) = \frac{500}{2}(4 + 503) = 126,750$$

83.  $a_1 = 20, d = 4, n = 30$

$$a_{30} = 20 + 29(4) = 136$$

$$S_{30} = \frac{30}{2}(20 + 136) = 2340 \text{ seats}$$

85.  $a_1 = 14, a_{18} = 31$

$$S_{18} = \frac{18}{2}(14 + 31) = 405 \text{ bricks}$$

87.  $a_1 = 25, a_2 = 25 + 2 = 27, \text{ etc.} \Rightarrow d = 2 \text{ and } n = 15.$

$$a_{15} = 2(15) + 23 = 53$$

$$S_{15} = \frac{15}{2}(25 + 53) = \frac{15}{2} \cdot 78 = 585 \text{ seats}$$