

HW Answers Unit 4 Lesson 4 p. 645 #69 - 91 ODD

69. $a_1 = 1, r = \frac{1}{2}$

$$\sum_{n=0}^{\infty} \left(\frac{1}{2}\right)^n = \frac{a_1}{1-r} = \frac{1}{1-(1/2)} = 2$$

71. $a_1 = 1, r = -\frac{1}{2}$

$$\sum_{n=0}^{\infty} \left(-\frac{1}{2}\right)^n = \sum_{n=1}^{\infty} \left(-\frac{1}{2}\right)^{n-1} = \frac{a_1}{1-r} = \frac{1}{1-(-1/2)} = \frac{2}{3}$$

73. $a_1 = 4, r = \frac{1}{4}$

$$\sum_{n=0}^{\infty} 4\left(\frac{1}{4}\right)^n = \frac{a_1}{1-r} = \frac{4}{1-(1/4)} = \frac{16}{3}$$

75. $\sum_{n=1}^{\infty} 2\left(\frac{2}{3}\right)^{n-1}$ does not have a finite sum ($\frac{2}{3} > 1$)

77. $\sum_{n=0}^{\infty} (0.4)^n, a_1 = 1, r = 0.4$

$$\sum_{n=0}^{\infty} (0.4)^n = \frac{a_1}{1-r} = \frac{1}{1-0.4} = \frac{1}{0.6} = \frac{10}{6} = \frac{5}{3}$$

79. $a = -3, r = 0.9$

$$\sum_{n=0}^{\infty} -3(0.9)^n = \frac{a_1}{1-r} = \frac{-3}{1-0.9} = \frac{-3}{0.1} = -30$$

81. $8 + 6 + \frac{9}{2} + \frac{27}{8} + \dots = \sum_{n=0}^{\infty} 8\left(\frac{3}{4}\right)^n = \frac{8}{1-3/4} = 32$

83. $3 - 1 + \frac{1}{3} - \frac{1}{9} + \dots = \sum_{n=0}^{\infty} 3\left(-\frac{1}{3}\right)^n = \frac{a_1}{1-r} = \frac{3}{1-(-1/3)} = 3\left(\frac{3}{4}\right) = \frac{9}{4}$

85. $0.\overline{36} = \sum_{n=0}^{\infty} 0.36(0.01)^n = \frac{0.36}{1-0.01} = \frac{0.36}{0.99} = \frac{36}{99} = \frac{4}{11}$

87. $0.3\overline{18} = 0.3 + \sum_{n=0}^{\infty} 0.018(0.01)^n = \frac{3}{10} + \frac{0.018}{1-0.01}$
 $= \frac{3}{10} + \frac{0.018}{0.99} = \frac{3}{10} + \frac{18}{990} = \frac{3}{10} + \frac{2}{110}$
 $= \frac{35}{110} = \frac{7}{22}$

89. $A = P\left(1 + \frac{r}{n}\right)^{nt} = 1000\left(1 + \frac{0.08}{n}\right)^{n(10)}$

91. $V_5 = 155,000(0.70)^5 = \$26,050.85$

(a) $n = 1, A = 1000(1 + 0.08)^{10} \approx \2158.92

(b) $n = 2, A = 1000\left(1 + \frac{0.08}{2}\right)^{2(10)} \approx \2191.12

(c) $n = 4, A = 1000\left(1 + \frac{0.08}{4}\right)^{4(10)} \approx \2208.04

(d) $n = 12, A = 1000\left(1 + \frac{0.08}{12}\right)^{12(10)} \approx \2219.64

(e) $n = 365, A = 1000\left(1 + \frac{0.08}{365}\right)^{365(10)} \approx \2225.35