

123. $S_n = \frac{a_1}{1-r} = \frac{30}{1+0.2} = 25.$

124. P.g. $a_4 = 10, a_6 = 0.4$

$a_6 = a_4 \cdot r^2 \Rightarrow 0.4 = 10 \cdot r^2 \Rightarrow r = \pm 0.2$

• $r = 0.2$: $a_4 = a_1 \cdot r \Rightarrow 10 = a_1 \cdot 0.2 \Rightarrow a_1 = 50$; $a_8 = a_1 \cdot r^7 = 50 \cdot 0.2^7 = 64 \cdot 10^{-4}$

$S_8 = \frac{50 \cdot (0.2^8 - 1)}{0.2 - 1} = 62.49984$; $S = \frac{50}{1-0.2} = 62.5$

• $r = -0.2$: $a_4 = a_1 \cdot r \Rightarrow 10 = a_1 \cdot (-0.2) \Rightarrow a_1 = -50$; $a_8 = -50 \cdot (-0.2)^7 = 64 \cdot 10^{-4}$

$S_8 = \frac{-50 \cdot ((-0.2)^8 - 1)}{-0.2 - 1} = -41.66656$; $S = \frac{-50}{1+0.2} = -41.6$

125. a) $d = 5, a_8 = 37$; $a_8 = a_1 + 7d \Rightarrow 37 = a_1 + 7 \cdot 5 \Rightarrow a_1 = 2$

$a_n = a_1 + (n-1) \cdot d = 2 + (n-1) \cdot 5 \Rightarrow a_n = 5n - 3$

b) $a_{11} = 17, d = 2$: $a_{11} = a_1 + 10d \Rightarrow 17 = a_1 + 10 \cdot 2 \Rightarrow a_1 = -3$

$a_n = -3 + (n-1) \cdot 2 \Rightarrow a_n = 2n - 5$

c) $a_2 = 18, a_7 = -17$: $a_7 = a_2 + 5d \Rightarrow -17 = 18 + 5d \Rightarrow d = -7$ $a_n = 32 - 7n$

$a_2 = a_1 + d \Rightarrow 18 = a_1 - 7 \Rightarrow a_1 = 25$; $a_n = 25 + (n-1) \cdot (-7)$

d) $a_1 = 15, a_{12} = 39$: $a_{12} = a_1 + 11d \Rightarrow 39 = 15 + 11d \Rightarrow d = 3$

$a_4 = a_1 + 3d \Rightarrow 15 = a_1 + 3 \cdot 3 \Rightarrow a_1 = 6$; $a_n = 6 + (n-1) \cdot 3 = 3n + 3$

126. a) $a_3 = 3, r = \frac{1}{10}$: $a_3 = a_1 \cdot r^2 \Rightarrow 3 = a_1 \cdot \left(\frac{1}{10}\right)^2 \Rightarrow a_1 = 300$; $a_n = 300 \cdot 0.1^{n-1}$

b) $a_4 = 2025, r = -1.5$: $a_4 = a_1 \cdot r^3 \Rightarrow 2025 = a_1 \cdot (-1.5)^3 \Rightarrow a_1 = -6$; $a_n = -6 \cdot (-1.5)^{n-1}$

c) $a_2 = 0.6, a_4 = 2.4$: $a_4 = a_2 \cdot r^2 \Rightarrow 2.4 = 0.6 \cdot r^2 \Rightarrow r = \pm 2$

• $r = 2$: $a_2 = a_1 \cdot r \Rightarrow 0.6 = a_1 \cdot 2 \Rightarrow a_1 = 0.3$; $a_n = 0.3 \cdot 2^{n-1}$

• $r = -2$: $a_1 = -0.3$; $a_n = -0.3 \cdot (-2)^{n-1}$

d) $a_3 = 32, a_6 = 4$: $a_6 = a_3 \cdot r^3 \Rightarrow 4 = 32 \cdot r^3 \Rightarrow r = 0.5 = \frac{1}{2}$

$a_3 = a_1 \cdot r^2 \Rightarrow 32 = a_1 \cdot 0.5^2 \Rightarrow a_1 = 128$; $a_n = 128 \cdot \left(\frac{1}{2}\right)^{n-1}$

127. $S_{10} = 120$; $a_1 = -5$ d a_{10}, d ?

$S_{10} = \frac{10 \cdot (a_1 + a_{10})}{2} \Rightarrow 120 = 5(-5 + a_{10}) \Rightarrow a_{10} = 29$; $a_{10} = a_1 + 9d \Rightarrow 29 = -5 + 9d \Rightarrow d = \frac{34}{9}$

128. P.g. $a_1 = 1000, a_4 = 8$: $a_4 = a_1 \cdot r^3 \Rightarrow 8 = 1000r^3 \Rightarrow r = 0.2$

$S_5 = \frac{a_1(r^5 - 1)}{r - 1} = \frac{1000 \cdot (0.2^5 - 1)}{0.2 - 1} = 1249.6$; $S = \frac{a_1}{1-r} = \frac{1000}{1-0.2} = 1250$