

Solutions to Applications of Algebra and Calculus 1.2

1. (a) $U_{18} = 7 + (18 - 1) \times 6 = 109$
(b) $S_{18} = \frac{18}{2} (2 \times 7 + (18 - 1) \times 6) = 1044$

2. (a) $U_3 = 4 + 2d + 14$
 $d = 5$
 $U_{10} = 4 + (10 - 1) \times 5 = 49$
(b) $S_{10} = \frac{10}{2} (2 \times 4 + (10 - 1) \times 5) = 265$

3. (a) $U_9 = 64 \times \left(\frac{1}{4}\right)^8 = \frac{1}{1024}$
(b) $S_n = \frac{256\left(1 - \left(\frac{1}{4}\right)^n\right)}{3}$

4. $e^{3x} = 1 + 3x + \frac{9x^2}{2} + \dots$

5. $\sin 2x = 2x - \frac{4x^3}{3} + \frac{4x^5}{15} - \dots$