

18.4

- 4. (a) $\sum_{k=2}^{\infty} 4x^k$

(b) $\sum_{k=1}^{\infty} (k+1)x^k$

- 10. (a) $\sum_{k=-1}^{\infty} e^{-k}$

(b) $\sum_{k=1}^{\infty} 2e^k$

(c) $\sum_{k=2}^{\infty} (2e)^{-k}$

12. $-\frac{3}{8} + \frac{3}{16}$, geometric with $r = -\frac{1}{2}$ hence converges to $\frac{-\frac{3}{8}}{1 - (-\frac{1}{2})} = -\frac{1}{4}$

13. $\frac{9}{4} + \frac{27}{16}$, geometric with $r = \frac{3}{4}$ hence converges to $\frac{\frac{9}{4}}{1 - \frac{3}{4}} = 9$

14. $-\frac{1}{3} + \frac{1}{9}$, geometric with $r = -\frac{1}{3}$ hence converges to $\frac{-\frac{1}{3}}{1 - (-\frac{1}{3})} = -\frac{1}{4}$

17. (a) $a = q^5$, $r = -q^2$, hence sum = $\frac{q^5 - q^{43}}{1 - (-q^2)} = \frac{q^5 - q^{43}}{1 + q^2}$

(b) $\sum_{k=0}^{18} q^5 (-q^2)^k = \sum_{k=0}^{18} (-1)^k q^{2k+5}$

(c) $\sum_{k=0}^{18} (-1)^{k+1} q^{2k+5}$

18. (a) $\sum_{k=1}^9 \frac{2}{3^{2k}} = \frac{\frac{2}{3^2} - \frac{2}{3^{20}}}{1 - \frac{1}{3^2}}$

(b) $\sum_{k=0}^{46} (-2)^k = \frac{1 - (-2)^{47}}{1 - (-2)}$

(c) $\sum_{k=0}^{100} \frac{(-1)^{k+1} (1.1)^k}{100} = \frac{-\frac{1}{100} - \frac{(1.1)^{101}}{100}}{1 - (-1.1)}$

(d) $\sum_{k=1}^{16} \frac{2^k}{3^{k+1}} = \frac{\frac{2}{3^2} - \frac{2^{17}}{3^{18}}}{1 - \frac{2}{3}}$