

Solutions

Each answer shows the steps, then the **result**.

2.1

- $\frac{1}{6}n(n+1)(2n+1)$

2.2

- $3 \cdot \frac{1}{2}(10)(11) - 10 = 165 - 10 = 155$

3.1 A

- $\sum r^3 = \frac{1}{4}n^2(n+1)^2$

3.2

(a)

- $\frac{1}{r(r+1)} = \frac{1}{r} - \frac{1}{r+1}$

(b)

- $\sum_{r=1}^n \left(\frac{1}{r} - \frac{1}{r+1} \right) = 1 - \frac{1}{n+1} = \frac{n}{n+1}$; as $n \rightarrow \infty$ the sum $\rightarrow 1$

3.3

- $\sum (r^2 + r) = \frac{1}{6}n(n+1)(2n+1) + \frac{1}{2}n(n+1); = \frac{1}{6}n(n+1)[(2n+1) + 3]; = \frac{1}{6}n(n+1)(2n+4) = \frac{1}{3}n(n+1)(n+2)$