**Practice for Applications of Algebra and Calculus**
**Applications of Algebra and Calculus Assessment Standard 1.3**

1. Evaluate:

$$\sum_{r=1}^{20} 3r =$$

$$\sum_{r=1}^{15} (4r - 3) =$$

$$\sum_{r=5}^{15} (2r + 1) =$$

(3 marks each)

2. Use proof by induction to show that

$$\sum_{r=1}^{n} 2r - 1 = n^2 \, , \forall n \in \mathbf{N}$$

(5 marks)

3. Use proof by induction to show that

$$\sum_{r=1}^{n} (3r - 1) = \frac{n(3n + 1)}{2} , \forall n \in \mathbf{N}$$

(5 marks)