

Replacement mark scheme – Q5, FP1 (6667) Specimen Paper

Question Number	Scheme	Marks
5. (a)	$\sum_{r=1}^n (r^2 - r - 1) = \sum_{r=1}^n r^2 - \sum_{r=1}^n r - \sum_{r=1}^n 1$ $\sum_{r=1}^n 1 = n$ $\sum_{r=1}^n (r^2 - r - 1) = \frac{n}{6}(n+1)(2n+1) - \frac{1}{2}n(n+1) - n$ $= \frac{n}{6}(2n^2 - 8)$ $= \frac{1}{3}(n-2)n(n+2) \quad (*)$	<p>M1</p> <p>B1</p> <p>M1</p> <p>M1 A1</p> <p>A1 (6)</p>
(b)	$\sum_{r=10}^{40} (r^2 - r - 1) = \sum_{r=1}^{40} (r^2 - r - 1) - \sum_{r=1}^9 (r^2 - r - 1)$ $= \frac{1}{3} \times 38 \times 40 \times 42 - \frac{1}{3} \times 7 \times 9 \times 11$ $= 21049$	<p>M1</p> <p>M1 A1 (3)</p> <p>(9 marks)</p>