Exercise 2

Paper 1 style · No calculator

2 4 marks SL 1.6 ●●○ Typical

Let n be an integer.

(a) Show that $(n+5)^2-(n+1)^2 \equiv 8(n+3)$. **[3]**

(b) Hence explain why the difference between the squares of two integers that differ by 4 is always a multiple of 8. **[1]**

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MARKSCHEME (a)

$(n+5)^2 = n^2+10n+25$ and $(n+1)^2 = n^2+2n+1$ **M1A1**

$n^2+10n+25-n^2-2n-1 = 8n+24$ **A1**

$= 8(n+3)$ **AG**

Total 3 marks

Note M1 for expanding a bracket; A1 for both correct.

MARKSCHEME (b)

$n+3$ is an integer, so $8(n+3)$ is a multiple of 8 **R1**

Total 1 mark

Note The two integers are $n+5$ and $n+1$.