

| Q     | Marking instructions                                                                 | AO   | Marks    | Typical solution                      |
|-------|--------------------------------------------------------------------------------------|------|----------|---------------------------------------|
| 12(a) | Substitutes $u_1 = 3$ into $\frac{-6}{u_n}$<br><br>PI $u_2 = -2$                     | 1.1a | M1       | $u_2 = -2$<br>$u_3 = 3$<br>$u_4 = -2$ |
|       | Obtains $u_2 = -2, u_3 = 3, u_4 = -2$<br>Condone missing labels if order is obvious. | 1.1b | A1       |                                       |
|       | <b>Subtotal</b>                                                                      |      | <b>2</b> |                                       |

| Q     | Marking instructions | AO   | Marks    | Typical solution |
|-------|----------------------|------|----------|------------------|
| 12(b) | States 2             | 2.2a | B1       | 2                |
|       | <b>Subtotal</b>      |      | <b>1</b> |                  |

| Q     | Marking instructions                                                                                             | AO   | Marks    | Typical solution                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------|------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12(c) | Shows that pairs of consecutive terms sum to 1 in a series<br>Or<br>Considers a sum of 3s and a sum of $\pm 2$ s | 3.1a | M1       | $\sum_{n=1}^{101} u_n = 3 - 2 + 3 - 2 + \dots + 3 - 2 + 3$ $\quad \quad \quad \underbrace{\quad \quad \quad}_{=1} \quad \quad \quad \underbrace{\quad \quad \quad}_{=50}$ $= 53$ |
|       | Deduces $\sum_{n=1}^{101} u_n = 53$                                                                              | 2.2a | R1       |                                                                                                                                                                                  |
|       | <b>Subtotal</b>                                                                                                  |      | <b>2</b> |                                                                                                                                                                                  |

|  |                          |  |          |  |
|--|--------------------------|--|----------|--|
|  | <b>Question 12 Total</b> |  | <b>5</b> |  |
|--|--------------------------|--|----------|--|