

3. An arithmetic series has first term  $a$  and common difference  $d$ , where  $a$  and  $d$  are constants.

Given that the sum of the first 65 terms of the series is 4940

- (a) show that

$$a + 32d = 76 \quad (2)$$

Given also that the 49th term of the series is 64

- (b) write down another equation connecting  $a$  and  $d$ . (1)

- (c) Hence find the value of  $a$  and the value of  $d$ . (2)

Given that  $S_n$  represents the sum of the first  $n$  terms of the series,

- (d) find the largest possible positive value of  $S_n$

*(Solutions relying entirely on calculator technology are not acceptable.)* (3)