1. A teacher earns an annual salary of 45 000 USD for the first year of her employment
Her annual salary increases by 1750 USD each year.

(a) Calculate the annual salary for the fifth year of her employment.

(3)

She remains in this employment for 10 years.

(b) Calculate the **total** salary she earns in this employment during these 10 years.

(3)
(Total 6 marks)

2. Mr Jones decides to increase the amount of money he spends on food by *d* GBP every year. In the first year he spends *a* GBP. In the 8th year he spends twice as much as in the 4th year. In the 20th year he spends 4000 GBP.

Find the value of *d*.

(Total 4 marks)

3. A woman deposits \$100 into her son's savings account on his first birthday. On his second birthday she deposits \$125, \$150 on his third birthday, and so on.

(a) How much money would she deposit into her son's account on his 17th birthday?

(b) How much in total would she have deposited after her son's 17th birthday?

(Total 4 marks)

5. A concert choir is arranged, per row, according to an arithmetic sequence. There are 20 singers in the fourth row and 32 singers in the eighth row.

(a) Find the common difference of this arithmetic sequence.

(3)

There are 10 rows in the choir and 11 singers in the first row.

(b) Find the **total** number of singers in the choir.

(3)

(Total 6 marks)

4. The first three terms of an arithmetic sequence are

$$2k + 3,\ 5k - 2 \text{ and } 10k - 15.$$

(a) Show that $k = 4$.

(3)

(b) Find the values of the first three terms of the sequence.

(1)

(c) Write down the value of the common difference.

(1)

(d) Calculate the 20^{th} term of the sequence.

(2)

(e) Find the sum of the first 15 terms of the sequence.

(2)

(Total 9 marks)

2 Zain goes swimming. He swims the first length of the pool in 2.5 minutes. The time he takes to swim each length is 10 seconds more than he took to swim the previous length.

a Find the time Zain takes to swim the third length.

b Find the time taken for Zain to swim a total of 10 lengths of the pool.

4 A lottery is offering prizes in a new competition. The winner may choose one of two options.

Option one: $1200 each week for 10 weeks.

Option two: $150 in the first week, $400 in the second week, $650 in the third week, increasing by $250 each week for a total of 10 weeks.

a Calculate the amount you receive in the tenth week, if you select Option two.

b What is the total amount you receive if you select Option two?

c Which option has the greatest total value?