SATPREP

Assignment: Algebra

1. Arturo goes swimming every week. He swims 200 metres in the first week. Each week he swims 30 metres more than the previous week. He continues for one year (52 weeks).

(a) How far does Arturo swim in the final week?

(b) How far does he swim altogether?

2. A theatre has 20 rows of seats. There are 15 seats in the first row, 17 seats in the second row, and each successive row of seats has two more seats in it than the previous row.

(a) Calculate the number of seats in the 20th row.

(b) Calculate the **total** number of seats.

3. The *Acme* insurance company sells two savings plans, Plan A and Plan B.
For Plan A, an investor starts with an initial deposit of \$1000 and increases this by \$80 each month, so that in the second month, the deposit is \$1080, the next month it is \$1160 and so on.
For Plan B, the investor again starts with \$1000 and each month deposits 6% more than the previous month.

(a) Write down the amount of money invested under Plan B in the second and third months.

Give your answers to parts (b) and (c) correct to the nearest dollar.

(b) Find the amount of the 12th deposit for each Plan.

(c) Find the total amount of money invested during the first 12 months

(i) under Plan A;

(ii) under Plan B.

4. In an arithmetic sequence, $S_{40} = 1900$ and $u_{40} = 106$. Find the value of u_1 and of d.

5. Find the term in x^3 in the expansion of $\left(\frac{2}{3}x - 3\right)^8$.

6. Let S_n be the sum of the first n terms of an arithmetic sequence, whose first three terms are u_1, u_2 and u_3. It is known that $S_1 = 7$, and $S_2 = 18$.

(a) Write down u_1.

(b) Calculate the common difference of the sequence.

(c) Calculate u_4.

7. In an arithmetic sequence $u_{21} = -37$ and $u_4 = -3$.

(a) Find

(i) the common difference;

(ii) the first term.

(b) Find S_{10}.

8. An arithmetic series has five terms. The first term is 2 and the last term is 32. Find the sum of the series.