Answer on Question #77127, Physics Mechanics Relativity

A company, which is making 200 mobile phone each week, plans to increase its production.

The number of mobile phones produced is to be increased by 20 each week from 200 in week 1, 220 in week 2, 240 in week 3 and so on until it is producing 600 in week N.

a) Find the value of N

The company then plans to produce 600 mobile phones each week.

b) Find the total number of mobile phones that will be made in the first 52 weeks starting from and including week 1.

Solution.

a) Let's make an arithmetic progression

$$200, 220, 240, \ldots., a_n, \ldots$$

Where $a_1 = 200, d = 20$

$$a_n = a_1 + (N - 1) \cdot d$$

$$600 = 200 + (N - 1) \cdot 20$$

$$N = 21$$

On the 21st week the company then plans to produce 600 mobile phones each week.

b)

$$S_n = \frac{2a_1 + d(N - 1)}{2} \cdot N$$

$$S_n = \frac{2 \cdot 200 + 20 \cdot (52 - 1)}{2} \cdot 52 = 710 \cdot 52 = 36920$$

The total number of mobile phones that will be made in the first 52 weeks starting from and including week 1 is 36920.

Answer: a) $N = 21$;   b) $S_n = 36920$