1. (a) $\boxed{43}$

   (b) $\boxed{1 + 3(n-1) = 3n - 2}$

2. $\boxed{15}$

3. $\boxed{95}$

4. We can notice that the series is the sum of multiples of 7 so we can factor out 7:

$$\begin{aligned} 21 + 28 + 35 + \cdots + 105 &= 7(3 + 4 + 5 + \cdots + 15) \\ &= 7\left[\frac{15(16)}{2} - 1 - 2\right] \\ &= \boxed{819} \end{aligned}$$

5. $\boxed{\text{-175}}$

6. $\boxed{\text{-3}}$

7. Let's represent the arithmetic series by $a_n = a_1 + k(n-1)$. Then the sum of the first 5 terms equalling 70 gives the following equation:

$$\begin{aligned} a_1 + a_2 + a_3 + a_4 + a_5 &= 5a_1 + k(0 + 1 + \cdots + 4) \\ = 5a_1 + 10k &= 70 \end{aligned}$$

   The sum of the first 10 terms equalling 210 gives the following equation:

$$\begin{aligned} a_1 + a_2 + \cdots + a_{10} &= 10a_1 + k(0 + 1 + \cdots + 9) \\ = 10a_1 + 45k &= 210 \end{aligned}$$

   We can solve this system of equations to get $k = \frac{14}{5}$ and $a_1 = \boxed{\frac{42}{5} = 8.4}$

8. $\boxed{8}$

9. $\boxed{300}$

10. Notice first that if our sequence was represented by $a_n = a_1 + k(n-1)$ then $a_2 - a_1 = k$. We can replace numbers in our sum with a_1 and k. The first sum is easier, giving us $100a_1 + 99k = 100$. The second sum is a little tricker. Notice that $a_{101} = a_1 + 100k$:

$$\begin{aligned} 100a_{101} + 99k &= 200 \\ 100(a_1 + 100k) + 99k &= 200 \\ 100a_1 + 10099k &= 200 \end{aligned}$$

Now if we solve the system of equations to get $a_2 - a_1 = k = \boxed{\frac{1}{100} = 0.01}$.