

1. State properties of the sequence  $\left\{\frac{n}{5}\right\}_{n=1}^{\infty}$
2. In an AP the 4<sup>th</sup> term is 0, the 6<sup>th</sup> term is -4. How many terms are to be summed if the sum is 12?  
[3 or 4]
3. AP: the 5<sup>th</sup> term is 23, the 12<sup>th</sup> term is 37. Find the 1<sup>st</sup> term, the common difference and the sum of the first eleven terms.  
[ $a_1 = 15, d = 2, s_{11} = 275$ ]
4. In an AP, the 10<sup>th</sup> term is 3 and sum of the first 6 terms is 76,5. Find the 1<sup>st</sup> term, difference and the smallest value for n such that  $s_n < 0$ .  
[ $a_1 = 16.5, d = -1.5, n = 24$ ]
5. Find the 5<sup>th</sup> term and sum of the first 5 terms of a GP, when 1<sup>st</sup> term is 27, and  $q = \frac{2}{3}$ .  
[ $a_5 = 16/3, s_5 = 211/3$ ]
6. A GP has first term 27 and  $q = 4/3$ . Find the least number of terms the GP can have if its sum exceeds 550.  
[ $n = 8$ ]
7. In a GP the 3<sup>rd</sup> term is 32, the 6<sup>th</sup> term is 4. Find the 1<sup>st</sup> term, quotient, and the sum of the first eight terms of the GP.  
[ $a_1 = 128, q = 1/2, s_8 = 255$ ]
8. State which is the first term to be negative for the following AP: 843, 836, 829, 822, etc.  
[122]
9. In an AP the 2<sup>nd</sup> term is -12, and sum of the first 12 terms is 18. Find the 1<sup>st</sup> term, difference and the 6<sup>th</sup> term. An AP has 1<sup>st</sup> term -5 and d is 1.5. Find the greatest number of terms the AP can have, given that the sum of the terms does not exceed 450.  
[ $a_1 = -15, d = 3, a_6 = 0$ ]
10. Three consecutive terms of an AP have a sum of 36 and a product of 1428. Find the three terms.  
[7, 12, 17]

11. A mathematical child negotiates a new pocket money deal with her unsuspecting father in which she receives 1p on the 1<sup>st</sup> day of the month, 2p on the 2<sup>nd</sup> day, 4p on the 3<sup>rd</sup> day, 8p on the 4<sup>th</sup> day, 16 p on the 5<sup>th</sup> day, ... until the end of the month. How much would the child receive during the course of a month of 30 days?  
[£ 11 million]
12. A product of three consecutive terms of an AP equals to their sum. Find these terms if  $d = \frac{13}{3}$ .  
[there are three solutions:  $-\frac{13}{3}, 0, \frac{13}{3}$  or  $\frac{1}{3}, \frac{14}{3}, 9$  or  $-9, -\frac{14}{3}, -\frac{1}{3}$ ]
13. The sides of a right-angled triangle form three consecutive terms of an AP. Find them if you know that the surface is  $6 \text{ dm}^2$ .  
[4, 3, 5]
14. The interior angles of a triangle form three consecutive terms of an AP. Find them if the sum of their cosines is  $\frac{5}{4}$ .  
[ $18^\circ 35', 60^\circ, 101^\circ 25'$ ]
15. Find the first 5 terms of a GP, if  $s_4 = 15$  and  $s_8 - s_4 = 240$ .  
[there are 2 solutions: 1, 2, 4, 8, 16 or -3, 6, -12, 24, -48]
16. If we add the same number to the numbers 2, 7, 17, we will obtain the first 3 terms of a GP. Find those terms.  
[5, 10, 20]
17. Železné rúry sa skladajú vo vrstvách tak, že rúry každej hornej vrstvy zapadajú do medzier dolnej vrstvy. Do koľkých vrstiev uložíme 102 rúr, ak v najvrchnejšej majú byť 3 rúry? Koľko rúr bude v najspodnejšej vrstve?  
[12 vrstiev, 14 rúr]
18. Teplota Zeme rastie s hĺbkou o  $1^\circ\text{C}$  na 33 metrov. Urči, aká je teplota na dne bane hlbkej 1015 metrov, ak v hĺbke 25 metrov je teplota  $9^\circ\text{C}$ .  
[ $39^\circ\text{C}$ ]
19. Baktérie sa v rastovom médiu množia delením, ku kt. dochádza vždy raz za pol hodiny. Koľko baktérií sa namnoží za 12 hodín z 1 baktérie?  
[16 770 000]