7. The first term is 1 in the geometric sequence 1, −3, 9, −27, ⋯. What is the SEVENTH term of the geometric sequence?

A. −243
B. −30
C. 81
D. 189
E. 729

60. The sum of an infinite geometric series with first term a and common ratio $r < 1$ is given by $\dfrac{a}{1-r}$. The sum of a given infinite geometric series is 200, and the common ratio is 0.15. What is the second term of this series?

F. 25.5
G. 30
H. 169.85
J. 170
K. 199.85

END OF TEST 2

58. What is the sum of the first 4 terms of the arithmetic sequence in which the 6th term is 8 and the 10th term is 13 ?

   F. 10.5
   G. 14.5
   H. 18
   J. 21.25
   K. 39.5

59. In an arithmetic series, the terms of the series are equally spread out. For example, in $1 + 5 + 9 + 13 + 17$, consecutive terms are 4 apart. If the first term in an arithmetic series is 3, the last term is 136, and the sum is 1,390, what are the first 3 terms?

A. 3, 10, 17

B. 3, 23, 43

C. 3, $36\frac{1}{3}$, 70

D. 3, $69\frac{1}{2}$, 136

E. 3, 139, 1,251

You don't know the number of terms

$1390 = \left(\dfrac{3 + 136}{2}\right) n$

$20 = n = \text{TERMS}$

$\#$ of

Arithmetic Sum Formula

$\left(\dfrac{a_1 + a_n}{2}\right) n$

a_1 1ST TERM
a_n Last TERM

$N = \#$ of TERMS

$136 + 3 = 139$
Inclusive
3 and 136 Need to add 1

$20\overline{)140}$
7 is Common
Difference

60. Right triangle $\triangle ABC$ has angle measures α, β, and γ degrees and side lengths a, b, and c inches, as illus-trated below. Which of the following is true about the

Trip

18. The first 5 terms of a geometric sequence are 0.375, −1.5, 6, −24, and 96. What is the 6th term?

F. −384
G. −126
H. −66
J. 126
K. 384

GEOMETRIC SEQUENCES hAVE COMMON RATIO. Find COMMON Ratio and Apply it to find NeXT Term.

$\dfrac{-24}{6} = -4$ −4 is COMMON Ratio $96 \times -4 = -384$

18. A sequence of 5 numbers has 6 as its first term and 32 as its last term. The first 3 numbers are an arithmetic sequence. The last 3 numbers are a geometric sequence with a common ratio of 2. What is the common difference among the first 3 terms?

F. 0
G. 1
H. 61
J. 67
K. 72

(handwritten notes)

6
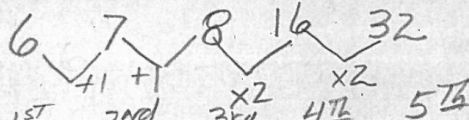
Arithmetic → Common difference
Geometric → Common Ratio

6   7   8   16   32
  +1   +1   ×2   ×2
1ST 2ND 3rd 4th 5th

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4. The 4th term of an arithmetic sequence is 3 and the sum of the first 6 terms is 27

   Find the first term and the common difference of this sequence.

6.
An arithmetic sequence has first term a and common difference d. The sum of the first 10 terms of the sequence is 162.

(a) Show that $10a + 45d = 162$

(2)

Given also that the sixth term of the sequence is 17,

(b) write down a second equation in a and d,

(1)

(c) find the value of a and the value of d

(4)

4. A girl saves money over a period of 200 weeks. She saves 5p in Week 1, 7p in Week 2, 9p in Week 3, and so on until Week 200. Her weekly savings form an arithmetic sequence.

(a) Find the amount she saves in Week 200.

(3)

(b) Calculate her total savings over the complete 200 week period.

(3)

5. A 40-year building programme for new houses began in Oldtown in the year 1951 (Year 1) and finished in 1990 (Year 40).

    The numbers of houses built each year form an arithmetic sequence with first term a and common difference d.

    Given that 2400 new houses were built in 1960 and 600 new houses were built in 1990, find

    (a) the value of d,

    (3)

    (b) the value of a,

    (2)

    (c) the total number of houses built in Oldtown over the 40-year period.

    (3)

7. A company, which is making 200 mobile phones 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 to 220 in week 2, to 240 in week 3 and so on, until it is producing 600 in week N.

(a) Find the value of N.

(2)

The company then plans to continue to make 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.

(5)