

If you didn't get the tables yesterday, copy quickly.

Remember... the quality of your histograms will be a big part of your grade on the TASK.

Single

1	270
2	216
3	243
4	240
5	234
6	259

Sum

2	41
3	95
4	126
5	190
6	244
7	292
8	226
9	209
10	132
11	98
12	73

Warm Up

Determine the type of sequence and the next 2 terms for each:

1) 5, 15, 25, ... 35 + 45

Arith

+10

3) Find the 35th term of #1

$$a_n = a_1 + (n-1)d$$

$$a_{35} = 5 + (35-1)10$$

$$= \boxed{345}$$

5) Find the sum of the first 35 terms of #1

series

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_{35} = \frac{35}{2}(5 + 345)$$

$$= \boxed{6,125}$$

Warm Up

Determine the type of sequence and the next 2 terms for each:

2) 5, 15, 45, ... 135 + 405

Geo

•3

4) Find the 12th term of #2

$$a_n = a_1 \cdot r^{n-1}$$

$$a_{12} = 5 \cdot 3^{12-1}$$

$$= 885,735$$

6) Find the sum of the first 12 terms of #2

$$S_n = \frac{a_1 \cdot (1 - r^n)}{1 - r}$$

$$S_{12} = \frac{5(1 - 3^{12})}{(1 - 3)}$$

$$= 1,328,600$$

Determine if each of the following are arithmetic, geometric or neither. Then find the next three terms for each:

1) 1, 5, 9, 13 ...

Arithmetic; 17, 21, 25

$+2 +4 +6 +8$

2) 2, 6, 18, 54 ...

Geometric; 162, 486, 1458

3) 8, 10, 14, 20, 28 ...

Neither; 38, 50, 64

4) 128, 64, 32 ...

Geometric; 16, 8, 4

$\bullet \frac{1}{2}$

5) 75, 70, 65, 60 ...

Arithmetic; 55, 50, 45

$+ -5$

For each of the following determine the type, the term in the sequence and the sum:

1) 5, 8, 11, 14 ...

the 45th term:

sum of 1st 45:

Arithmetic / Geometric

$$\mathbf{A; a_{45} = 137}$$

$$\mathbf{S_{45} = 3195}$$

2) 6, 12, 24, 48 ...

the 9th term:

sum of 1st 9:

Arithmetic / Geometric

$$\mathbf{G; a_9 = 1536}$$

$$\mathbf{S_9 = 3066}$$

3) 640, 320, 160 ...

the 8th term:

sum of 1st 8:

Arithmetic / Geometric

$$\mathbf{G; a_8 = 5}$$

$$\mathbf{S_8 = 1275}$$

$$S_8 = \frac{640(1 - (\frac{1}{2})^8)}{1 - \frac{1}{2}}$$

4) 56, 48, 40, 32 ...

the 100th term:

sum of 1st 100:

Arithmetic / Geometric

$$\mathbf{A; a_{100} = -736}$$

$$\mathbf{S_{100} = -34000}$$

$$S_{100} = \frac{100}{2}(56 - 736)$$

Unit 7: Sequence and Series

Sequences Series

Arithmetic

Geometric

Pattern of Addition No Mention of Sum Usually Looking for Last Term	Pattern of Multiplication No Mention of Sum Usually Looking for Last Term
Pattern of Addition Sum or Series in Question	Pattern of Multiplication Sum or Series in Question

a_n = Last Term

a_1 = 1st Term

n = How Many Terms

S or S_n = Sum

d = Common Difference (Arith. Only)

r = Common Ratio (Geo. Only)

1) Find the 45th term: $-8, -2, 4, 10, \dots$

$$a_1 + 6 + 6 + 6 \quad d=6$$

$$a_{45} = -8 + (45-1)6$$
$$= \boxed{256}$$

2) Find the 1st term: $a_{34} = 78$ and $d = 11$

$$78 = a_1 + (34-1)11$$

$$78 = a_1 + 363$$
$$\underline{-363} \quad \underline{-363}$$

$$\boxed{a_1 = -285}$$

3) Find the common difference:

$$5, \underline{12}, \underline{19}, \underline{26}, \underline{33}, 40$$

a_1 $n=6$ a_n

$$40 = 5 + (6-1)d$$

$$40 = 5 + 5d$$

-5 -5

$$35 = 5d$$

$\frac{35}{5} = \frac{5d}{5}$

$$d = 7$$

4) How many terms are in the sequence:

$$15, 17, 19, \dots, 211$$

a_1 $d=2$ a_n

$$n = 99$$

$$211 = 15 + (n-1)2$$

-15 -15

$$\frac{196}{2} = \frac{(n-1)2}{2}$$

$$98 = n-1$$

$+1$ $+1$

Other Geometric Sequence Questions

5) Find the 10th term: 4, 10, 25, ... $r = \frac{a_2}{a_1}$

$$a_{10} = 4 \cdot 2.5^{10-1}$$

$$a_1 \cdot r^{n-1}$$
$$\boxed{15,258.79}$$

$$\frac{10}{4} = 2.5$$

6) Find the 1st term: $a_{12} = 512$ and $r = 2$

$$512 = a_1 \cdot 2^{12-1}$$

$$512 = a_1 \cdot 2048$$

$$a_n$$

$$\boxed{a_1 = \frac{1}{4}}$$

7) Find the common ratio:

$$128, \underline{\quad}, \underline{\quad}, \underline{\quad}, 648$$

a_1 $n=5$ a_n

$$\boxed{r = 1.5}$$

$$\frac{648}{128} = \frac{128 r^{5-1}}{128}$$

$$5.0625 = r^4$$

$$5.0625^{1/4} = r$$

Today::

1) WB 703

#1-12 Skip #7

Due Tomorrow

2) Continue Working on TASK

Due Friday