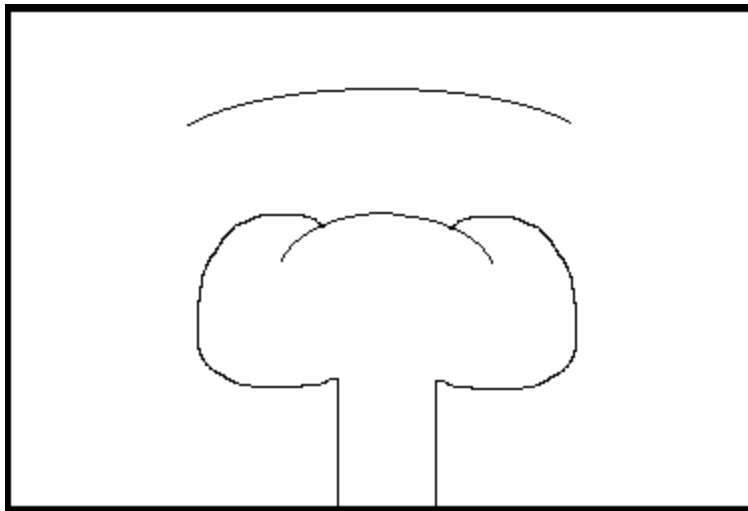# An Algebra II Turvy to Review Sequences and Series
by David Pleacher

A Turvy is a Drawing which has a caption right side up
and has another caption if you turn it topsy-turvy.

Caption for the picture:

"__ __ __ __ __ __ __   __ __ __ __   __ __ __ __ __ __ __   __ __ __ __ __."
  14 8 17 7 14 17 3   12 1 16 2   8 18 10 10 14 3 4   11 14 15 15 17

Caption for the picture turned upside down:

"__ __ __ __ __ - __ __   __ __   __   __ __ __ __ __ __ __
  12 7 18 10 16   5 11   18 2   17   12 17 13 13 17 4 16

__ __ __ __ __   __ __ __."
11 17 8 12 1   9 14 6

To determine the titles to this turvy, solve the 18 problems about sequences and series.
Then find the answers to each problem from the choices below.
Then replace each numbered blank with the letter corresponding to the answer for that problem.

___ 1. Determine the sum of the infinite series $5 + 1\frac{2}{3} + \frac{5}{9} + \ldots$

___ 2. If the 6th term of an arithmetic sequence is 8 and the 11th term is 2, what is the first term?

___ 3. Find a_{10} in the sequence 1, 4, 7, 10, …

___ 4. Determine the sum of the first 8 terms of the geometric sequence

$$4, \quad -\frac{4}{3}, \quad \frac{4}{9}, \quad -\frac{4}{27}, \quad \ldots$$

___ 5. Insert 4 geometric means between 160 and 5. What is the first of these geometric means?

___ 6. Determine the 5th term of the geometric sequence $2, \quad -\frac{3}{2}, \quad \frac{9}{8}, \quad \ldots$

___ 7. The 4th term of a geometric sequence is $\frac{1}{2}$ and the 6th term is $\frac{1}{8}$.
Find the common ratio.

___ 8. Determine the sum of the infinite series $10 + 3\frac{1}{3} + 1\frac{1}{9} + \ldots$

___ 9. A person has 2 parents, 4 grandparents, 8 great-grandparents, and so on.
Determine the number of his ancestors during the 8 generations preceding his own (provided that there are no duplications).

___ 10. Determine the sum of the first 25 positive even integers.

___ 11. Determine the sum of the arithmetic series 5 + 9 + 13 + .. + 401.

___ 12. Insert 4 arithmetic means between 1 and 36. Determine the first of these arithmetic means.

___ 13. If the 7th term of a geometric sequence is 192 and r = 2, determine the first term.

___ 14. Determine the sum of the first ten terms of the geometric sequence
    15, 30, 60, 120, …

___ 15. Determine the value of a_{17} for the sequence   6, 1, -4, …

___ 16. Evaluate $\sum\limits_{i=1}^{3}(4i+1)$

___ 17. If the 6th term of an arithmetic sequence is 9 and the 11th term is -1, what is the
    first term?

___ 18. If the 1st term of an arithmetic sequence is 4 and the 12th term is 32, find the
    common difference.

Answers:

a. 19	h. $7\frac{1}{2}$	o. $\dfrac{28}{11}$
b. 3	i. 15,345	p. 20,300
c. 8	j. 17	s. 650
d. $\dfrac{81}{128}$	k. 510	t. 15
e. 27	l. ½, –½	u. 80
f. 14	m. 0	w. 81
g. $\dfrac{6560}{2187}$	n. 28	z. -74