

Nassau County Interscholastic Mathematics League

Contest 3 All answers must be in simplest exact form unless otherwise specified. 2006-2007

No calculators

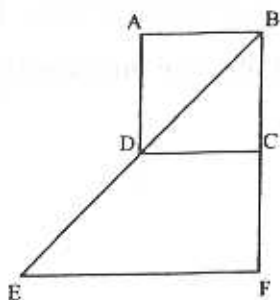
Problems 13-14. Time limit: 10 minutes

#13. What is the total number of distinct 3-digit numbers which have a digit-sum of 7?

#14. The degree-measure of an exterior angle of a regular polygon exceeds the number of its diagonals by 1. Compute the number of sides of the polygon.

Problems 15-16. Time limit: 10 minutes

#15. In the figure below, square ABCD has an area of 50. Diagonal \overline{BD} is extended through D to point E such that $BE = 20$ and side \overline{BC} is extended its own length through C to point F. \overline{EF} is drawn. Compute the area of trapezoid CDEF.



#16. A 45-lb watermelon was originally 80% water, by weight. It dehydrates, losing only water, to the point where it is now only 60% water, by weight. Compute the number of pounds in the new weight of the watermelon.

Problems 17-18. Time limit: 10 minutes

#17. At 11:57 am, Mary began reading a book from the top of page 3 and read every page thereafter until she had reached the bottom of page 29 at 12:33 pm. Beth read all pages of the same edition of the same book from the top of page 3 through the bottom of page 59 in 1 hour and 15 minutes. Assuming their reading rates remain constant and the book contains a total of 342 pages, compute, in minutes, the difference in the length of time it will take the two to finish the entire book?

#18. The front of a train whose length is 500 ft enters a 17,100-ft long tunnel, traveling at a constant rate of 40 mph. Given that 1 mile = 5,280 ft, compute the number of minutes it takes the train to clear the tunnel.

Answers:

#13. 28

#14. 10

#15. 75

#16. 13.5

#17. 6

#18. 5