Nassau County Interscholastic Mathematics League

Contest # 2 Answers must be in simplest exact form, unless otherwise noted 2005-2006

Calculators

Problems 7-8 Time limit: 10 minutes.

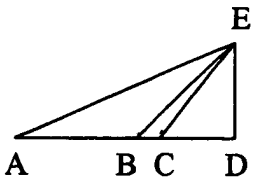
7. In his first five basketball games, Otto made 16 out of 24 free throws, for a free throw percentage of $66\frac{2}{3}\%$. How many more consecutive free throws must he make in order to raise his free throw percentage to $86\frac{2}{3}\%$?

8. The area of a rhombus is 336. The lengths of the diagonals have a sum of 62. Find the length of an altitude of the rhombus.

Problems 9-10 Time limit: 10 minutes.

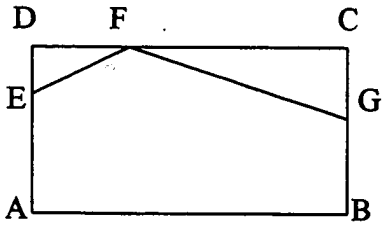
9. The probability that it will rain on Monday is 40%, on Tuesday 30%, on Wednesday 60%, on Thursday 25%, and on Friday 50%. If the probability that it will rain at least once in the five days from Monday to Friday is $k\%$, find the value of k.

10. In triangle ADE, m$\angle$D=90°, and EC, AB, and EB are consecutive odd integers, in that order. If BD is 4 less than EC, and CD = 15, find AE.



Problems 11-12 Time limit: 10 minutes.

11. In Rectangle ABCD, points E, F, and G are located on sides $\overline{AD}$, $\overline{DC}$, and $\overline{CB}$ respectively, such that DE:EA = 1:3, DF:FC = 1:4, and CG:GB = 1:2. If the area of pentagon AEFGB is 50.5, find the area of rectangle ABCD.



12. In a new lotto game, you must choose six numbers from the numbers 1 to 25. Six winning numbers are drawn, then one supplemental number is drawn from the remaining numbers. You win Fifth Prize if the six numbers you have chosen contain exactly three of the winning numbers and the supplemental number. Find the probability of winning Fifth Prize.

Answers:

7. 36

8. $\frac{336}{25}$

9. 93.7

10. 52

11. 60

12. $\frac{153}{8855}$