



Math Olympiad and Problem Solving Programs
E230 - Advanced Math Competitions
Problem Set 3.2 - AMC 8 Counting

Name:

Date:

1. D
2. Case 1: Pat buys one type of donut. There are 3 ways to do this: all glazed, all chocolate, all powdered.
Case 2: Pat buys two types of donut. He can either buy 2 of one and 2 of the other, or 1 of one and 3 of the other. There are $C(3, 2) = 3$ ways of choosing 2 kinds from the three available, so there are $(2 \text{ arrangements}) \times (3 \text{ type combinations}) = 6$ ways to buy two types of donuts.
Case 3: Pat buys all three types of donut. There is only one arrangement: he buys 1 of one, 1 of the second, and 2 of the third type. There are $3! = 6$ ways of assigning flavors to these three amounts.
 $3 + 6 + 6 = 15$. D
3. A
4. C
5. Start from the bottom and work upwards. 120: USOMA. 119: USOAM. 118: USMOA. 117: USMAO. 116: USAOM. 115: USAMO. D
6. D
7. C
8. C
9. B