



Math Olympiad and Problem Solving Programs  
E210 - Introductory Math Competitions  
Problem Set 10.1 - SAT Number Theory

Name:

Date:

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1.  D
2.  A
3.  E
4. First simplify  $\left(a^{\frac{1}{2}}b^{\frac{1}{3}}\right)^6 = a^3b^2$ . Also, prime factorize  $432 = 2^43^3$ . So let  $a = 3$ , and  $b = 4$ , so that we get  $a^3b^2 = 3^34^2 = 432$ . So then  $ab = 3 \cdot 4 = 12$ .  B
5.  C
6.  B
7. If Stacy is 12th tallest, then there are 11 people taller than her. If she is 12th shortest, there are 11 people shorter than her. Then there are  $11 + 11 + 1 = 23$  students in the class (the +1 includes Stacy).  B
8. For  $k = 4, 6, 12$ ,  $15 \div k$  has remainder 3. So there are three values of  $k$ .  C
9.  C
10.  E