

BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2006

Junior Final Round, Part A

Friday May 5, 2006

1. Four schools have collected a total of 8888 food tins for charity. One school beat the others by 888, 88, and 8 tins, respectively. The number of tins collected by the school with the second most number of tins is:

(A) 2460 (B) 2222 (C) 2468 (D) 2300 (E) 2230

2. The number of non-negative integer solutions, (x, y) , to the equation $2x + 3y = 97$ is:

(A) 14 (B) 16 (C) 20 (D) 30 (E) 33

3. A 6-sided die with the odd numbers from 5 to 15 on the six faces is tossed twice. The probability of throwing a sum from 16 to 24, inclusive, is:

(A) $\frac{13}{36}$ (B) $\frac{2}{3}$ (C) $\frac{25}{36}$ (D) $\frac{13}{18}$ (E) $\frac{5}{6}$

4. Consider the expression

$$1_2_3_4_5_6$$

Using only $+$ or \times as replacements for the blanks in the expression above and allowing free use of parentheses, the maximum possible result is:

(A) 720 (B) 721 (C) 2160 (D) 1801 (E) 1080

5. The number of integers between 1 and 100 that can be written as the sum of the squares of two positive integers in at least one way is:

(A) 30 (B) 31 (C) 33 (D) 34 (E) 36

6. At a dinner party each bowl of rice is shared by two guests, each bowl of soup is shared by three guests, and each meat dish is shared by four guests. Every guest ate from exactly one bowl of rice, one bowl of soup, and one meat dish. If the total number of bowls and dishes is 65, then the number of guests at the dinner party was:

(A) 55 (B) 60 (C) 65 (D) 70 (E) 75

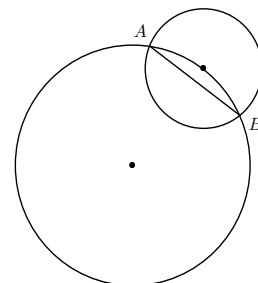
7. A cathedral tower 80 metres high is 100 metres from a nearby church tower that is 60 metres high. There is a pigeon at the top of each tower. Both pigeons see a pile of grain on the level straight road joining the two towers. The two pigeons start flying toward the grain at the same time and at the same speed. If the pigeons reach the grain at the same instant, the distance, in metres, of the pile of grain from the foot of the cathedral tower is:

(A) 34 (B) 35 (C) 36 (D) 37 (E) 38

8. Two circles are shown in the diagram. The larger circle has radius 2, and the smaller circle has radius 1 and its centre is on the circumference of the larger circle. The length of the chord AB is:

(A) $\frac{\sqrt{15}}{2}$ (B) $\frac{5\sqrt{34}}{17}$ (C) 2

(D) $\frac{3}{2}$ (E) $\frac{15}{8}$

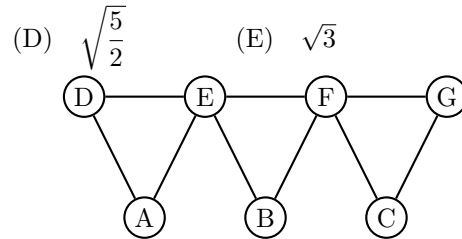


9. The value of

$$\sqrt{1 + \frac{\sqrt{3}}{2}} + \sqrt{1 - \frac{\sqrt{3}}{2}}$$

in simplified form is:

- (A) $\frac{1}{2}$ (B) 1 (C) $\sqrt{2}$
10. Seven of the ten numbers 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 are selected and placed in the circles in the diagram in such a way that the products of the three numbers in each of the three triangles ADE , BEF , and CFG are equal. The number in circle B is:



- (A) 13 (B) 12 (C) 8 (D) 5
- (E) not uniquely determined