DHMS Math Club **September 24, 2013**

Solutions to 2011-12 Math is Cool Championship Team Contest, 6th grade

1. There are 16 cups in a gallon. 48 cups per minute is 3 gallons per minute. In three minutes, the elephant will drink 9 gallons. **Answer: 9**
2. Boy: Girl ratio is 3: 4. 3 out of 7 students are boys. The number of boys in a class of 21 students is (21/7)*3 = 9. **Answer: 9**
3. One and three quarter hours is 1:45. Go back 1:45 from 2:34 pm (or go back 2:00 from 2:34 pm and go forward 0:15). Remember to specify am or pm. Answer: **12:49 p.m**.
4. The largest square number less than 150 is 12-squared = 144. Among these numbers, 1, 2, 3, 4, 10, 11 and 12 have unit digits less than 5. Remember that the answer is not the numbers themselves but how many of them there are. There are seven such numbers. Answer: **7**
5. Remember that the answer must be in feet (not yards or inches). Bert threw the ball 12 yards = 36 feet. Ernie threw the ball 8.4 meters = 8.4*39 inches = 8.4*39/12 feet = 0.7*39 feet = 27.3 feet. Bert threw the ball (36 – 27.3) feet longer than Ernie. **Answer = 8.7**
6. 23¼ as a percent is 23.25*100 = 2325%. **Answer: 2325%**
7. Volume formulas: circular pan volume = πr^2 * depth; square pan = a^2 * depth; rectangular pan = length * breadth * depth. (Here, r is radius and a is side length). Since the depth is the same, we compare πr^2, a^2 , and length*breadth. Red: diameter is 8; radius is 4; πr^2 = (22/7)*4*4 = 352/7 = 50 2/7.
   Green: diameter = 9; radius = 9/2; πr^2 = (22/7)*(9/2)*(9/2) = 891/14 = 63 9/14 ; Blue: length*breadth = 7*11 = 77;
   Black: a^2 = 9*9 = 81;
   White: a^2 = 8*8 = 64
   The closest are green and white. You can specify them in any order.
   Answer: Green, white (or) White, green
8. Take the product of 7*8*9 = 504. Subtract 7 and add 4 (or subtract 8 and add 5) or (subtract 9 and add 6). You get 501, which meets the 3 conditions.
   Answer: 501.
9. The only way to get 6 cents from 2 coins is with a nickel and a penny. The probability that the first coin is a nickel and second coin is a penny is (3/8)*(2/7) = 3/28. The probability that the first coin is a penny and the second coin is a nickel is (2/8)*(3/7) = 3/28. Since we can get 6 cents with nickel followed by a penny OR penny followed by nickel, we add the two probabilities. (Remember to multiply the two probabilities for AND; add the two probabilities for OR). (3/28)+(3/28) = 3/14; **Answer = 3/14**
10. The smallest has to start with 1 and the largest with 9. Smallest is 124563987. Largest is 987635421. The difference is 863071434. **Answer: 863071434**

Solutions by Ram Devanathan