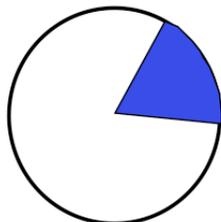


Math Awareness Month Competition 2011

Solutions for 3rd-4th Grades

1. Chris, Eric, Kelsey and Ronnie baked a round cake. Then each of them took a sector of the cake; a sector of the cake is shaped like the shaded area in the picture below. Chris took one third, Eric took one fourth, Kelsey took one fifth, and Ronnie took one sixth of the whole cake. What is the angle in degrees of the remaining section?



[Solution: They took $\frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} = \frac{57}{60}$ part of the whole cake, so $\frac{3}{60} = \frac{1}{20}$ remained. The $\frac{1}{20}$ part of 360° is **18**°.]

2. Anna draws a circle and a triangle on each page of her booklet, and near each drawing she writes the number of common points of the circle and the triangle. How many different numbers can she write?

[Solution: A circle and a line segment may have at most 2 common points, hence a circle and a triangle may have at most 6 common points. All the numbers from 0 to 6 can occur. Therefore, **7** is the correct answer.]

3. Melissa plays Samantha in a game with twelve rounds. In each round, the winner scores 5 points and the loser scores 3 points. At the end of the game, Samantha's total score is 44 points. How many rounds did Melissa win?

[Solution: Samantha must have won 4 games and lost 8 games, because $5 \times 4 + 3 \times 8 = 44$ and no other combinations would result in 44 points. Thus, Melissa won 8 games.]

4. Jeff, Josh and Justin have 5 apples in total. In how many ways can it happen? (It is possible that not each of them has an apple.)

[Solution: Let us count the ways to distribute the 5 apples. In the case the 5 apples are distributed as 5-0-0 (one boy gets 5 apples and the others get no apples), there are 3 ways. In case the 5 apples are distributed as 4-1-0, there are $3 \times 2 = 6$ ways (there are 3 ways to choose who gets 4 apples, and there are 2 further ways to choose who gets only 1 apple). Similarly, the case 3-2-0 can happen in $3 \times 2 = 6$ ways. The case 3-1-1 can happen in 3 ways (there are 3 ways to choose who gets 3 apples). Finally, the case 2-2-1 can happen in 3 ways (there are 3 ways to choose who gets 1 apple). Altogether, there are **21** ways.]

5. Oliver's credit card number has 16 digits. The sum of any three adjacent digits is 13, and the second digit is 2 and the tenth digit is 4. What are the last three digits of the credit card number?

[Solution: If the first three digits of the number are a,b,c, then $a+b+c=13$. Because the sum of the second, third, and fourth digits is also 13, the fourth digit must be a, too. Similar considerations give that the number can be written as abcabcabcabcabca. From the assumptions, $b=2$ and $a=4$. Thus, $c=7$. Therefore, the last three digits are **2, 7, 4**.]