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**upper primary Division**

**Grades 3 and 4**

**Contest Instructions and Information:**

**Part I: Individual Contest**

1. The IMOYA Contest has 3 Sections:

 Section A is composed of 5 calculations skills items.

 Section B is composed of 5 perk-ups problem items.

 Section C is composed of 5 challenging problem items.

2. Enter the letter of the correct answer on the space provided for each number.

3. Diagrams are NOT drawn to scale

4. No calculator, calculating device or protractor is allowed.

5. Time limit: 90 minutes

**SECTION A. Calculation Skill Problems**

*Compute each of the following using a simple method. Each correct answer worth 4 points. Total of 20 points.*

1. Compute: .

 A. 3090 B. 3900 C. 4000 D. 2900

 **Suggested Solution:**

 .

 The answer is B.

2. Compute:  = ?

 A. 2500 B. 2060 C. 2700 D. 2600

 **Suggested Solution:**

 .

 The answer is D.

3. Calculate: 

 A. 1900 B. 19000 C. 10900D. 10090

 **Suggested Solution:**

 .

 The answer is B.

4. Calculate: 

 A. 15 B. 16 C. 17 D. 18

 **Suggested Solution:**

 .

 The answer is B.

5. Calculate:

 A. 5460 B. 6504 C. 4560 D. 4650

 **Suggested Solution:**

 .

 The answer is D.

**SECTION B. Simple Problems**

*Select the correct answer in each problem. Each problem is worth 5 points, for a total of 30 points.*

1. Find the digits represented by and.

 A. = 2, = 4 B.= 7,= 3

 C. = 7, = 4 D. = 2,= 3

 Suggested Solution:

 

 The answer is B

2. What is the mass of given the balance scale below?



 A. 100 g B. 200 g C. 300 g D. 400g

**Suggested Solution:**

 Mass of the 2= Mass of 1+ Mass of 1

 300 g + 300 g = Mass of + 400 g

 600 g = Mass of + 400 g

 Mass of = 600 g – 400 g = 200 g

 The answer is B

3. Audrey and Johan shared a whole cake. Audrey ate  of the cake and Johan ate  of it. What fraction of the cake was left?

 A.  B. C. D.

 **Suggested Solution:**

 

 The answer is D

4. How many greater than right angle(s) are there in the given irregular pentagon?

 A. 1 B.2 C.3 D.4

 **Suggested Solution:**

 The answer is B

5. The figure is made up of two squares. Find the perimeter of the figure.

 A. 24 cm B.25 cm C.26 cm D.34 cm

 **Suggested Solution:**

 

 The answer is C

**SECTION C. Challenging Problems**

*Solve each word problem. Simplified Solution of each problem is a must and it worth 10 points for a total of 50 points.*

1. Each shape represents a number. What is the value of the square?

 A. 8 B. 9 C. 10 D. 12

 **Suggested Solution:**

 , So = 3

 . So, = 3

 

 . So = 9.

 The answer is B.

2. Teacher Angie has 144 cookies. She wants to place all the cookies into several small paper bags equally, so that each small bag contains not less than 10 or not more than 40 cookies. How many methods are there to distribute the cookies in the small paper bags?

 A. 3 B. 4 C. 5 D. 6

**Suggested Solution:**

From the given information, we know teacher Angie wants to distribute 144 cookies equally into several small paper bags. Since  so the factors of 144 are 1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72 and 144. Among those 15 factors, there are 5 factors that are more than 10 and less than 40: 12, 16, 18, 24, 36, so there are 5 different methods to distribute 144 cookies, they are (a) 12 bags each with 12 cookies, (b) 9 paper bags each with 16 cookies, (c) 8 paper bags each with 18 cookies, (d) 6 paper bags each with 24 cookies, (e) 4 paper bags each with 36 cookies.

The answer is C.

3. There is a beetle wants to crawl from point *A* to point *F* along certain line segments (as shown in the figure below). If the same point or the same line can only pass once, how many possible paths does the beetle have crawl from points *A* to *F*?

 A. 3 B. 6 C. 9 D. 12

 **Suggested Solution:**

There are three ways to go from *A*, namely *AB*, *AE*, *AD*. First take the *AB* line segment, there are 3 ways to move: *B*→*C*→*F*, *B*→*F*, *B*→*E*→*F*. There are also 3 ways to walk *AE* and *AD*; that is, there are 9 different ways to move.

The answer is C.

4. The password of an ATM card is a four-digit number. Some people created their passwords by using the product of the thousands digit and the hundreds digit to be the tens digits and the ones digits in the four-digit number (such as 2816, 9327, …). When the product of the thousands digit and the hundreds digit is a one-digit number, then digit in the tens place will replace by 0. If the digit 0 is also allowed in the thousand’s place and hundred’s place, then how many possible combinations are there when creating this type of password?

A.90 B.99 C.100 D. 112

**Suggested Solution:**

We know that digits can be repeated in the thousands’ place and hundreds’ place of the four-digit number to be created, because there are 10 different digits (0 to 9) to be fill in the thousands’ place and 10 different digits to fill in the hundreds’ place. Hence, there are  different combinations.

The answer is C.

5. There are two jars contain the same number of marbles. The marbles are red or white colors. The number of red marbles in the first jar is 7 times the number of white marbles while the number of red marbles in the second jar is 9 times that of the white marbles. If there are a total of 90 white color marbles in the two jars, then how many red marbles are there in the second jar?

A.360 B.400 C.450 D.36 E.40

**Suggested Solution #1**:

From the given information, we know the number of marbles in the first jar is a multiple of 8 while the number of marbles in the second jar is a multiple of 10.

Since the total number of marbles in the two jars is the same, we also know the number of marbles must be a multiple of 8 and 10,so it must be the common multiple of 8 and 10, they are 40, 80, 120, 160, 200, 240, 280, 320, 360, 400, 440, 

By Trial and Checking, there are  white marbles and  red marbles in the first jar;  white marbles and  red marbles in the second jar.

**Suggested Solution #2**:

Let****represent the number of white marbles in the first jar, then  represent the number of red marbles in the first jar. Since there are a total of 90white marbles in the two jars. Then there are  white marbles in the second and  will be the red marbles in the second jar. We set up the e equation white marbles in the 1st jar, so there are  white marbles in the 2nd jar. It follows there are  red marbles in the 2nd jar.

The answer is A.