



2^{WMO}
014

World Mathematics Olympic Competition

The 7th world cup (Columbia,America)

L2



Name: _____ Grade: _____

Country: _____ Number: _____



WMO
2014

Level 2: The World Cup Finals

Total score: 100 Time: 90min



Section 1: Single choice questions

There are 10 questions in this section. Each question has only one correct answer.
Please select the correct answer from the answer list.
5 scores each question, totally 50 scores.

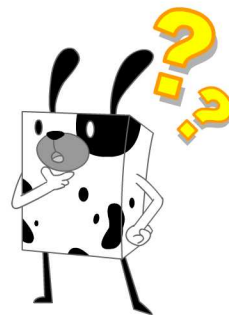
1. Please solve the equation $10\frac{1}{20} + (3 - 0.85) \div \frac{5}{6} = (\quad)$.

- (A) 1.263 (B) 12.63
(C) 126.3 (D) 0.1263



2. Which one of the answers is right in the middle of $\frac{1}{4}$ and $\frac{1}{16}$? ()

- (A) $\frac{5}{32}$ (B) $\frac{1}{8}$
(C) $\frac{5}{16}$ (D) $\frac{1}{12}$



3. We want to make a 30% salt solution. If we have 70 grams water,
How many grams salt do we need? ()

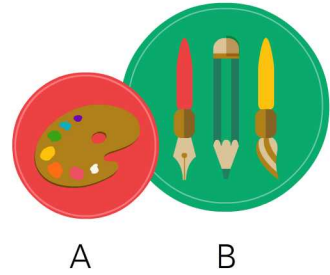
- (A) 21 (B) 30
(C) 40 (D) 50



4. 2 circles A and B, The ratio of their perimeters is 9:10.
What is the ratio of their areas? ()

(A) 9:10 (B) 10:9

(C) 81:100 (D) 1:1



5. Two ropes A and B have a same length which is longer than a meter. Cut $\frac{3}{4}$ meter from rope A and cut $\frac{3}{4}$ of its total length from rope B.
Which rope is longer now? ()

(A) rope A (B) rope B

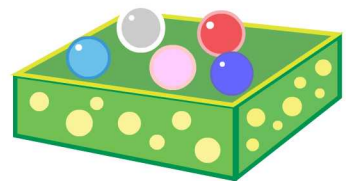
(C) same length (D) incomparable



6. 4 balls are in a box, 1 is red, 1 is green, and 2 are white. Randomly take out two balls, the probability of taking 2 white balls is? ()

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$

(C) $\frac{1}{6}$ (D) $\frac{1}{12}$



7. Two products were sold for 60 dollars each, one transaction made a 20% profit whereas the other one caused a 20% deficit. What is the overall outcome of the two transactions? ()

- (A) even (B) 5 dollars deficit
 (C) 5 dollars profit (D) 10 dollars profit



8. It took 5 hours for a car to travel from location A to location B and 4 hours for it to return. The return speed is increased by () ?

- (A) 5% (B) 25%
 (C) 20% (D) incalculable



9. The average height of the class is 115cm. the average height of girls is 10% greater than that of the boys. The number of boys is $\frac{1}{5}$ greater than that of the girls. What is the average height of the boys? ()

- (A) 110cm (B) 121cm (C) 115cm (D) 120cm

10. There are 10 playing cards, from 1 to 10. 5 persons A, B, C, D and E, each took 2 cards randomly. The sum of the cards in A' s hands is 2 times of that of B' s. The sum of the cards in B' s hands is 2 times of that of E' s. The sum of the cards in C' s hands is 2 times of D' s. Can you tell that who has the card 6? ()

- (A) A (B) B
 (C) C (D) D





Section 2: problem solving

5 scores each question, totally 50 scores.

1. Dr. Long wants to buy 16 copies of a book. He can choose between 2 book stores. The 2 book stores have 2 different discounts. Book store A offers a 20% discount. Book store B is offering “buy 3 get 1”. What is your recommendation for Dr. Long?
2. Carbon emission reduction concerns everyone. According to scientific reports, 1 hectare broad-leaved forest absorbs 14 tons of carbon dioxide per year. If we set an air conditioner from 26°C to 27°C for the whole summer, we can reduce carbon dioxide emission by 21kg. By this method, the amount of carbon dioxide emission reduced in a city per year equals to the amount of carbon dioxide that 25,000 hectare broad-leaved forest can absorb in 1 year. If we know that in this city, every household has 3 air conditioners, Can you calculate that how many household are in the city?
3. To alleviate the huge traffic pressure on nation's railway system during the Chinese New Year, the ministry of railway initiated online ticket office system. A railway station has sold 100 tickets, as shown in the diagram below. The ordinate is the ticket-price whereas the abscissa is the destination of the tickets.

We also know that:

- the ratio of tickets to city A, B, D is 1 : 15 : 22.
- there are 20 tickets to city C and 4 tickets to city E.
- the average price of the 100 tickets is 205.

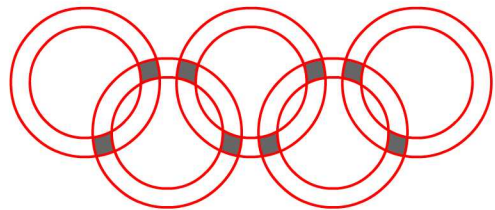
Please calculate the price of the tickets to city D.



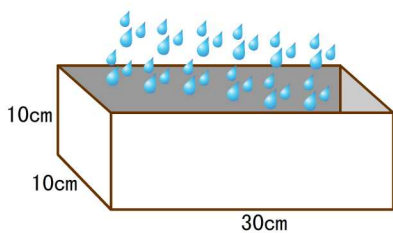
4. The symbol of the Olympic Games is composed of five interlocking rings, coloured blue, yellow, black, green, and red on a white field, known as the "Olympic rings". People think that the 5 interlocking rings represent the union of the five continents of the world and the meeting of athletes from throughout the world at the Olympic Games. If, as shown in the picture below:

- the radius of outer rings is 10cm.
- the areas of the interlocking parts (shaded parts) are all the same, which is 40cm^2 .
- the entire area covered by the five rings is 684.8cm^2 .

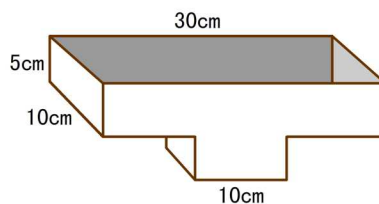
Can you calculate the radius of the inner rings?



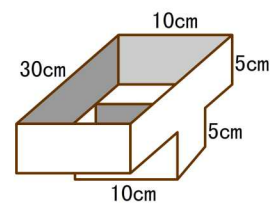
5. 2 precipitation gauges are shown in the pictures 1 and 2 respectively. Both gauges were put in the rain. The gauge in picture 1 is filled after 1 hour. Can you calculate that how long it takes for the rain to fill the gauge in picture 2?



(picture 1)



(From a positive perspective)



(From the angle of view)

(picture 2)