

CRPF PUBLIC SCHOOL, ROHINI

First Intra School Mathematics Olympiad 2010

CLASS XI

Max. Marks: 60

Time: 1 hour 30 minutes

General Instructions:

1. Each question of Section A (Q1-5) carries 2 marks, that of Section B (Q6-15) carries 3 marks and of Section C (Q16-20) carries 4 marks.
2. Each question has five choices (A, B, C, D or E). Select the correct answer to each question and darken the corresponding circle in the Answer Sheet provided to you. For each correct answer in section A, B and C, two, three and four marks will be awarded respectively. **One mark will be deducted for each incorrect answer (of all the sections), while no mark will be deducted for any unattempted question.** Darkening of more than one circle for any answer shall bear zero mark.
3. Darken the correct circle with HB Pencil ONLY.
4. Do not make any stray marks on the answer sheet and do not use it for any kind of Rough Work.

SECTION - A

Q1. The numbers 49, 29, 9, 40, 22, 15, 53, 33, 13, 47 are grouped in pairs so that the sum of each pair is the same. Which number is paired with 15?

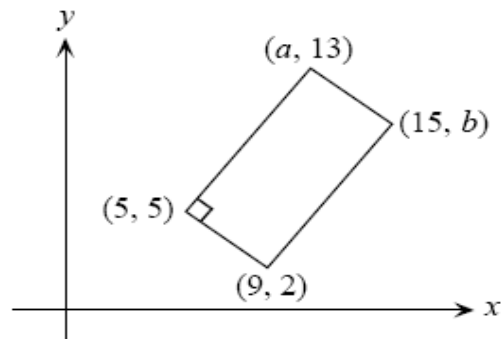
- (A) 33 (B) 40 (C) 47 (D) 49 (E) 53

Q2. The time on a digital clock is 5:55. How many minutes will pass before the clock next shows a time with all digits identical?

- (A) 71 (B) 72 (C) 255 (D) 316 (E) 436

Q3. In the rectangle shown, the value of $a - b$ is

- (A) -3 (B) -1 (C) 0
(D) 3 (E) 1



- Q4. In the sequence, each figure is made up of small squares of side length 1. What is the outer perimeter of the fifth figure in the sequence?



- (A) 9 (B) 18 (C) 20 (D) 24 (E) 36

- Q5. Suppose that a , b and c are three numbers with

$$\begin{aligned} a + b &= 3 \\ ac + b &= 18 \\ bc + a &= 6 \end{aligned}$$

The value of c is

- (A) 2 (B) 11 (C) 3 (D) 6 (E) 7

SECTION - B

- Q6. In the four term sequence 0.001, 0.02, 0.4, x , each term after the first is found by multiplying the previous term by the same number. What is the value of x ?

- (A) 0.8 (B) 8 (C) 80 (D) 8.8 (E) 0.08

- Q7. The point $(0, 0)$ is reflected in the vertical line $x = 1$. When its image is then reflected in the line $y = 2$, the resulting point is

- (A) $(0, 0)$ (B) $(2, 0)$ (C) $(4, 4)$ (D) $(2, 2)$ (E) $(2, 4)$

- Q8. There are a certain number of red balls, green balls and blue balls in a bag. Of the balls in the bag, $\frac{1}{3}$ are red and $\frac{2}{7}$ are blue. The number of green balls in the bag is 8 less than twice the number of blue balls. The number of green balls in the bag is

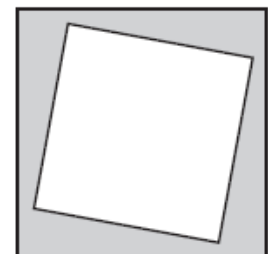
- (A) 12 (B) 16 (C) 20 (D) 24 (E) 28

- Q9. What is the largest integer n for which $3(n^{2007}) < 3^{4015}$?

- (A) 2 (B) 3 (C) 6 (D) 8 (E) 9

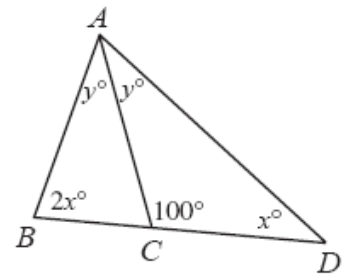
- Q10. In the diagram, a smaller square lies inside a larger square. The perimeter of the smaller square is 72 cm. The shaded area is 160 cm^2 . The perimeter of the larger square, in cm, is

- (A) 58 (B) 88 (C) 116
(D) 121 (E) 112



Q11. In the diagram, B, C and D lie on a straight line, with $\angle ACD = 100^\circ$, $\angle ADB = x^\circ$, $\angle ABD = 2x^\circ$, and $\angle DAC = \angle BAC = y^\circ$. The value of x is

- (A) 10 (B) 45 (C) 30
 (D) 50 (E) 20



Q12. $\frac{1}{2} + \frac{2^1}{2^2} + \frac{2^2}{2^3} + \dots + \frac{2^{2002}}{2^{2003}} + \frac{2^{2003}}{2^{2004}}$ is equal to

- (A) 1002 (B) 501 (C) $\frac{1}{2^{2004}}$ (D) 2004 (E) $\frac{2004}{2^{2004}}$

Q13. The sum of the digits of the integer equal to $777\,777\,777\,777\,777^2 - 222\,222\,222\,222\,222^2$ is

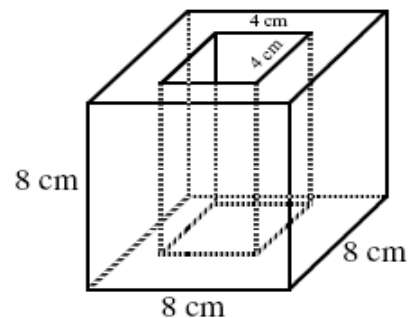
- (A) 148 (B) 84 (C) 74 (D) 69 (E) 79

Q14. The 6 members of an executive committee want to call a meeting. Each of them phones 6 different people, who in turn each calls 6 other people. If no one is called more than once, how many people will know about the meeting?

- (A) 18 (B) 36 (C) 216 (D) 252 (E) 258

Q15. An 8 cm cube has a 4 cm square hole cut through its centre, as shown. What is the remaining volume, in cm^3 ?

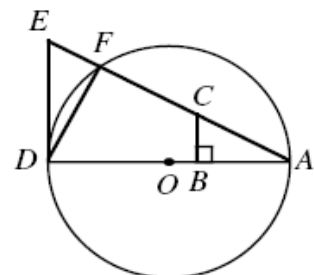
- (A) 64 (B) 128 (C) 256
 (D) 384 (E) 448



SECTION - C

Q16. In the diagram shown, $\angle ABC = 90^\circ$, $CB \parallel ED$, $AB = DF$, $AD = 24$, $AE = 25$ and O is the centre of the circle. Determine the perimeter of $CBDF$.

- (A) 39 (B) 40 (C) 42
 (D) 43 (E) 44

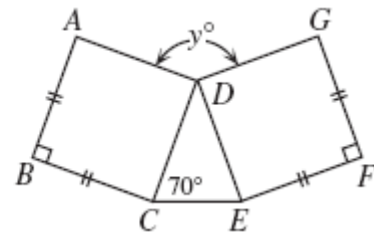


Q17. Two cylindrical tanks sit side by side on a level surface. The first tank has a radius of 4 metres, a height of 10 metres, and is full of water. The second tank has a radius of 6 metres, a height of 8 metres, and is empty. Water is pumped from the first tank to the second until the depth of water in both tanks is the same. The depth of water in each tank, in metres, is

- (A) 4 (B) 5 (C) $\frac{46}{15}$ (D) $\frac{52}{17}$ (E) $\frac{40}{13}$

Q18. In the diagram, $ABCD$ and $DEFG$ are squares with equal side lengths, and $\angle DCE = 70^\circ$. The value of y is

- (A) 120 (B) 160 (C) 130
(D) 110 (E) 140



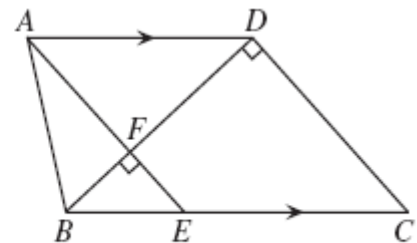
Q19. In the magic square, the sum of the three numbers in any row, column or diagonal is the same. The sum of the three numbers in any row is

- (A) 0 (B) 1 (C) 3
(D) 7 (E) 9

$2x$	3	2
		-3
0	x	

Q20. In trapezoid $ABCD$, AD is parallel to BC . Also, BD is perpendicular to DC . The point F is chosen on line BD so that AF is perpendicular to BD . AF is extended to meet BC at point E . If $AB = 41$, $AD = 50$ and $BF = 9$, what is the area of quadrilateral $FECD$?

- (A) 900 (B) 1523.5 (C) 960
(D) 1560 (E) 1300



NOTE: The **answer key** of this question paper will be available on the School's blog www.crpfpsrohini.blogspot.com on November 9, 2010 after 6 pm. The **Result** will be declared on 16 November and will also be available on the school's blog.