Prime CAT 13 2022 QA

Q 1. The combo pack containing a brush and a paste is priced at Rs. 44. If the price of brush is decreased by 10% and that of paste is increased by 25%, then the price of the pack is Rs. 48. What is the difference (in Rs.) between the cost of a paste and a brush?

Q 2. Glass I and glass II contain liquid A, liquid B and liquid C in the ratio 2 : 1 : 2 and 1 : 3 : 2 respectively. Some part of the solution from glass I and glass II are thoroughly mixed and put into another class III. Which of the following cannot be the ratio of liquid A, liquid B and liquid C in glass III?

1) 17 : 21 : 22

2) 5 : 5 : 6

3) 3 : 4 : 5

4) 8 : 9 : 10

Q 3. How many integral solutions exist for the equation 6x – y = 168, such that the values that 'x' assumes have opposite signs as compared to the corresponding values of 'y'?

1) 26

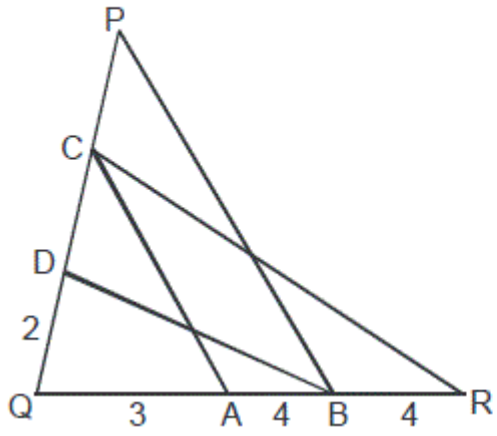
2) 27

3) 28

4) 25

Q 4.

In the figure given below, RC is parallel to DB and AC is parallel to BP, QD = 2 units, QA = 3 units and AB = BR = 4 units. The ratio of areas of ΔQDB and ΔPQB is



1) 4 : 11

2) 3 : 4

3) 4 : 7

4) 3 : 11

Q 5. Half of a class of 180 students enrolled for exactly one of the three activities namely singing, racing and dancing. Total enrollments were 70 in singing, 65 in racing and 50 in dancing from the class. Out of those students who enrolled only for both racing and singing were 10 more than the students who enrolled only for both racing and dancing. What is the minimum possible number of students who enrolled for at least one of the three activities?

1) 125

2) 126

3) 124

4) 127

Q 6. Asha started running from one end of a straight road at 6:30 AM. Beena, standing at the other end of the road, started running towards Asha at 7:00 AM and met Asha at a point O on the road. They continued running till they reached the opposite ends, turned back immediately and coincidently met again at the same point O. If they met at the point O for the first time at 8:00 AM, then the ratio of the speeds of Asha and Beena is

1) 1 : 2

2) 1 : √2

3) √2 : √3

4) 2 : √3

Q 7. Find all the values of b, such that 8 lies somewhere between the roots of the equation $x^2 + 2(b - 4)x + 16 = 0$. ('x' is a real number.)

1) $b > -1$

2) $b > 8$

3) $0 < b < 8$

4) $b < -1$

Q 8. The number of players in Group A and Group B in a sports academy are in the ratio 3 : 4 in May and 15 : 13 in June. The number of players in Group A and Group B is increased from June to July at a rate that is twice and thrice respectively, of the rate at which it increased from May to June. If the ratio of the aggregate number of players in these two groups in June and May is 8 : 1, then what is the ratio of number of players in Group A and Group B in July?

1) 16 : 13

2) 114 : 91

3) 39 : 31

4) 207 : 91

Q 9. The area of bounded regions generated by the curves $|x| = 4$, $y = |x|$ and $y = -|x|$ is ___ sq. units.

Q 10. Pihu, Quin, Reet, Sita and Tina are working upon a project, which is divided into phases such that only one person works on each phase. The work done per phase by them is inversely proportional to their age in years. Pihu has worked on 4 phases of the project whereas Quin has worked on 5 phases. Tina and Sita have worked on 8 phases each and the rest of the phases were worked upon by Reet, who received the honour of having worked upon 40% of the project. If the ages of these 5 persons are 36 years, 18 years, 9 years, 72 years and 24 years respectively, then how many more/ less phases than Sita did Reet work on?

Q 11. A shopkeeper has four packets of sugar which he wants to weigh. The aggregate weight of the packets of sugar taken two at a time is 19 kg, 26 kg, 29 kg, 31 kg, 34 kg and 41 kg. If a fifth packet of sugar has to be added such that the average weight now becomes 3 kg higher than the original average, then what is the average (in kg) of the new packet of sugar?

Q 12. If $||x - 2|-1| < 7$ and $||y - 1| - 2| < 9$, where x and y are integers, then which of the following is a possible value of $(x - 2y)$?

1) 28

2) 29

3) −26

4) −30

Q 13. On giving 3 candies free with every 5 chocolates bought, a shopkeeper makes a profit of 20% and on giving 6 candies free with every 2 chocolates bought, he suffers a loss of 25%. Find the approximate profit percent made by the shopkeeper when he gives 5 candies free with every 7 chocolates bought, if the selling price of 1 chocolate remains the same. (Assume that the candies are identical and the same applies to the chocolates.)

1) 17%

2) 20%

3) 19%

4) 14%

Q 14. ABCD is a rhombus. E, F, G and H are the mid points of sides AB, BC, CD and DA respectively. O is the point of intersection of the diagonals of the rhombus ABCD. M and N are the mid points of FO and OG respectively. Find the ratio of the area of the pentagon MNGCF to area of the quadrilateral EHNM.

1) 7 : 9

2) 2 : 3

3) 8 : 9

4) 5 : 6

Q 15. Two pipes A and B can completely fill a water tank in 6 hours and 7 hours respectively and pipe C can empty a tank filled completely with water in 5 hours. Initially the tank is empty and all the pipes are closed. Pipe A is opened first at time t = 0 and pipe C is opened at the instant when the tank is exactly half filled with water. Pipe B is opened after pipe C and at the instant when the tank is exactly one-fourth filled with water. Find the total time (in hours) taken to fill the tank completely counting from t = 0.

1) $13\frac{3}{17}$

2) $17\frac{8}{23}$

3) $16\frac{3}{23}$

4) $18\frac{2}{3}$

Q 16. Let M be a three-digit number denoted by 'ABC' where A, B and C are numerals from 0 to 9. Let N be a number formed by reversing the digits of M. It is known that M – N + 198C is equal to 990. How many possible values of M are there which are greater than 505?

Q 17. Given that $\log_x(\log_y(\log_z p)) = 0$, where each of x, y and z can assume distinct values among 7, 49 and 2401 only. If the product of all possible values of 'p' is represented in the form of 7^n, then what is the value of 'n'?

1) 8400

2) 7490

3) 7520

4) 9360

Q 18. If $x + (x + 1) + (x + 2) + \ldots + (x + k) = 98$, where x and k are positive integers, then how many such pairs (x, k) exist?

1) 1

2) 3

3) 4

4) 2

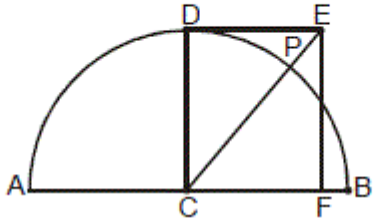
Q 19. If 4096 is added to the product of the 13th, 14th, 15th and 16th term of an arithmetic progression, then a perfect square is obtained. If each term of this arithmetic progression is a positive integer, then find the common difference of the arithmetic progression.

Q 20. Prem and Ram walk up a moving up escalator at constant speeds. For every 8 steps that Prem takes, Ram takes 3 steps. How many steps would each have to climb when the escalator is switched off, given that Prem takes 32 and Ram takes 24 steps to climb up the escalator moving up respectively?

Q 21. If f(x) is a real function such that $3f(x) = f(x + 1) + 2f(x - 1)$ for all $x \geq 1$ and $f(0) = 1$, $f(1) = 2$ and then $f(7)$ is equal to _____.

Q 22.

A semicircle with center at C and radius equal to 4 units is drawn with AB as the diameter as shown in the figure given below. CDEF is a rectangle such that the ratio of area of the semicircle to the area of the rectangle is $2\pi : 3$. CE cuts the semicircle at P. Find the length of the line segment PB.



1) $\frac{8}{5}\sqrt{5}$ units

2) $\frac{5}{3}\sqrt{5}$ units

3) $\frac{17}{9}\sqrt{5}$ units

4) $\frac{9}{5}\sqrt{5}$ units
