# Prime CAT 08 2022 QA

**Q 1.** What is the sum of all the real roots of the equation $|x - 3|(|x - 3| + 1) = 20$?

**1)** 12

**2)** 8

**3)** 6

**4)** −12

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**Q 2.** Priya had two glasses A and B having capacities 'a' ml and 'b' ml respectively, both a and b are natural numbers. Glass A was 5/6 full of water and B was 3/7 full of water. If Priya poured all the water from glass A into B, then glass B will be 3/4 full of water. If fully filled A and B glasses are poured into a glass C, then what should be the minimum volume (in ml) of glass C?

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**Q 3.** Sasha went to a shop to buy a dress. She spent 10% of the amount in her wallet to travel to the shop by a taxi. The amount left was equal to the list price of one of the dresses in the shop. After purchasing the dress at a 30% discount on the list price, she was able to buy a hand bag worth Rs.580 and still save Rs.230. What was the initial amount (in Rs.) in Sasha's wallet?

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**Q 4.** NCC cadets are made to stand in rows in the Independence Day Parade. If there are 6 additional cadets in a row, then there would be 3 rows less. If there are 6 cadets less in a row, there would be 4 rows more. The total number of NCC cadets in the parade is

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**Q 5.** In a construction project, machine A operates on a cycle of 20 hours of work followed by 4 hours of rest and machine B operates on a cycle of 40 hours of work followed by 8 hours of rest. Both machines began their respective cycles at 12 PM on Monday and continued till 12 PM on the following Saturday. On which days during that time period was there a time when both machines were at rest?

**1)** Wednesday and Saturday

**2)** Tuesday and Thursday

**3)** Wednesday and Friday

**4)** Tuesday and Friday

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**Q 6.** Two trains running at 72 kmph and 54 kmph cross each other in 16 seconds, when they run in opposite directions. When they run in the same direction, a person in the faster train observes that he crossed the other train in 50 seconds. Find the length (in meter) of the longer train.

**1)** 250

**2)** 320

**3)** 310

**4)** 290

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**Q 7.** If on a square ABCD, point P lies on AB and Q lies on CD such that CP = PQ = QA = 10 cm, then the area (in sq. cm) of the square ABCD is

**1)** 100

**2)** 90

**3)** 900/13

**4)** 80

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**Q 8.** What is the number of 4-digit numbers that can be formed from the digits 1, 2, 4, 5, 6, 7, 8 and 9 in which at least one digit is repeated?

**1)** 3537

**2)** 4096

**3)** 1561

**4)** 2416

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**Q 9.** Two pipes A and B can fill a tank in 12 minutes and 24 minutes respectively. The tank also has two holes, one at half the height and the second at 3/4th the height from bottom which could empty the tank (if they were at the bottom of the tank) in 40 minutes and 60 minutes respectively. If the tank is initially empty and the two pipes A and B are opened simultaneously, in how much time (in minutes) will the tank be full?

**1)** 7.5

**2)** 8

**3)** 9.5

**4)** 12

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**Q 10.** Total Rs. 7,800 is raised for a picnic by collecting the equal amount from a certain number of students. If there were 26 more students to raise the same amount, each student would have to contribute Rs. 400 less, how many students actually contributed?

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**Q 11.** Let N = ab4530 is a 6-digit number where a and b are distinct positive integers, then what is the value of a + b such that N is divisible by 6, 7 and 9?

**1)** 15

**2)** 6

**3)** 12

**4)** 18

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**Q 12.** The marked price of three articles A, B and C are Rs.2,200, Rs.3,000 and Rs.2,500 respectively. Article A is sold at a discount of 5%, B at a discount of 8% and C at a discount of 6%, yet the shopkeeper got an overall profit of 20%. If the cost price of B is 50% more than that of A and the cost price of A is twice that of C, then what percent above the cost price has article A been marked?

**1)** 5%

**2)** 10%

**3)** 12%

**4)** 15%

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**Q 13.** A dog is 30 of its own leaps behind a cat. The dog takes 4 leaps per second to cat's 3. If the dog and the cat cover 4 m and 2 m per leap respectively, then how far (in meter) did the cat run before being caught by the dog?

**1)** 192

**2)** 72

**3)** 60

**4)** 84

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**Q 14.**

Let $f_n(x) = f_1(x) + 2f_2(x) + \ldots + (n-1)f_{n-1}(x)$, $n \geq 2$, where n is a natural number and $f_1(x) = x/2$, then what is the value of $f_m(x)$?

**1)** $\frac{xm!}{2}$

**2)** $\frac{x(m-1)!}{2}$

**3)** $\frac{xm!}{4}$

**4)** $\frac{x(m-1)!}{4}$

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**Q 15.** Srinath earned Rs.1.6 lakh per month from January to June after which there was a steady increase of Rs.10,000 per month for four months. The average monthly income of Srinath for the whole year was Rs.1.8 lakh. If the income for December was 20% more than that of October, then what was his monthly income (in Rs.) for November?

**Q 16.** If four circles of maximum equal area are cut out from a square of side 4 cm, then the ratio of the areas of the four circles to the area of the remaining part of the square is

**1)** $\pi : 4$

**2)** $2\pi : (4 - \pi)$

**3)** $\pi : (4 - \pi)$

**4)** $2\pi : (8 - \pi)$

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**Q 17.** If $\log_3 [\log_2 (x^2 - 4x - 13)] = 1$, then the possible number of value(s) of x is

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**Q 18.** In 8 liters of milk and water mixture, the concentration of milk is 75%. A woman takes out 25% of the total mixture and adds the equal quantity of water in a new beaker to form a new mixture. With the total quantity of the new mixture, she wants to prepare tea where the concentration of milk should be 25%. How much more (in liters) water will she require to add to the mixture to prepare tea?

**1)** 2.5

**2)** 1

**3)** 1.5

**4)** 2

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**Q 19.** Let a sequence $a_n$ be defined recursively by $a_0 = 3$, $a_{n+1} = 2a_n + 3$. What is the last digit of $a_{2018}$?

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**Q 20.** A circle of radius 3 cm is inscribed in a right angled triangle ABC, right angled at B. If BC = 12 cm, then find the length (in cm) of side AB.

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**Q 21.** If $|x^2 - 11x + 30| > x^2 - 11x + 30$, then which of the following statements is true?

**1)** x cannot take value greater than 5.

**2)** x can take any real value.

**3)** x can take any value between 5 and 6.

**4)** x can take values either less than 5 or greater than 6.

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**Q 22.** Ramesh invested an amount of Rs.X for 2 years at 10% compound interest and received some amount of interest. Mahesh invested Rs. (X + 4400) for 3 years at 6% simple interest and received the same amount of interest as Ramesh received. Find the amount (in Rs.) that is invested by Mahesh.

**1)** 30,800

**2)** 25,600

**3)** 35,400

**4)** 40,200

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