M. Prakash Institute **STD IX - Entrance Test 3**
19 April 2026 **Time: 3 hours**
Note: Q1 to Q10 are of 2 marks each, Q11 to Q30 are of 4 marks each.
Total Marks: 100 **Paper Type:AD**
Student Receipt number: **Student Name:**

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	40	25	16	18	13	80	6	9	5	13
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	30	85	40	48	61	12	70	40	6	60
Ques.	21	22	23	24	25	26	27	28	29	30
Ans.	28	84	54	15	10	86	15	12	24	17

Q1. Two numbers are in the ratio 2 : 3. Their LCM is 48. What is their sum?

Solution: Ratio $2:3 \Rightarrow$ numbers $2k, 3k$. LCM $= 6k = 48 \Rightarrow k = 8$. Sum $= 16 + 24 = 40$. **Ans. 40.**

Q2. If 50% of $(x - y) = 30\%(x + y)$, then what percent of x is y?

Solution: $50\%(x - y) = 30\%(x + y) \Rightarrow 0.2x = 0.8y \Rightarrow y = \frac{1}{4}x = 25\%$ of x. **Ans. 25.**

Q3. The number $0.\overline{657834}$ has the digits "657834" repeating again and again after the decimal point. What is the square of the digit that comes at the 1044^{th} place after the decimal?

Solution: Block 657834 (length 6). $1044 \equiv 0 \pmod 6 \Rightarrow$ digit is the 6th, i.e. 4. Square 16. **Ans. 16.**

Q4. x and y are inversely proportional. Given $x = 12$ when $y = 15$, find y when $x = 10$.

Solution: Inverse proportion: $xy = 12 \cdot 15 = 180$. For $x = 10$, $y = 18$. **Ans. 18.**

Q5. Before her latest innings in world cup cricket, a batter had played 9 matches. In the 10^{th} match she scored 49 runs, and her average rose by 4. Find her new average.

Solution: Let old avg (9 matches) $= a$. $10(a + 4) = 9a + 49 \Rightarrow a = 9 \Rightarrow$ new avg $= 13$. **Ans. 13.**

Q6. A man distributes 860 gold coins among five sons, four daughters, and two nephews. Each daughter gets 4 times as much as a nephew, and each son gets 5 times as much as a nephew. How many coins does each daughter get?

Solution: Let each nephew gets t coins. Total $= 2t + 4(4t) + 5(5t) = 43t = 860 \Rightarrow t = 20$. Each daughter $= 80$. **Ans. 80.**

Q7. How many pieces of $\frac{2}{3}$ kg can be cut from a 4 kg cake?

Solution: Pieces $= \dfrac{4}{2/3} = 6$. **Ans. 6.**

Q8. $\dfrac{60}{Q} = \dfrac{1}{\sqrt{0.0225}}$. Find Q.

Solution: $\dfrac{60}{Q} = \dfrac{1}{\sqrt{0.0225}} = \dfrac{1}{0.15} = \dfrac{20}{3} \Rightarrow Q = 9$. **Ans. 9.**

Q9. A regular polygon has each exterior angle equal to 72°. How many sides does the polygon have?

Solution: Exterior angle $72^\circ \Rightarrow n = \dfrac{360}{72} = 5$ sides. **Ans. 5.**

Q10. The number $30^{202} \times 7^{202} \times 13^{202}$ can be written in the form: $(a \times (a+1) \times (a+2))^{202}$ for some positive integer a. Find the value of a.

Solution: $30^{202} \cdot 7^{202} \cdot 13^{202} = 15^{202} \cdot 14^{202} \cdot 13^{202} = (a(a+1)(a+2))^{202} \Rightarrow a = 13$. **Ans. 13.**

Q11. Pipes A and B fill a tank in 60 and 40 minutes, respectively. Pipe C empties it in 120 minutes. If all three are opened together, how many minutes will it take to fill the tank?

Solution: Rates: $\frac{1}{60} + \frac{1}{40} - \frac{1}{120} = \frac{4}{120} = \frac{1}{30}$. Time = 30 min. **Ans. 30.**

Q12. Three pairwise co-prime numbers x, y, and z satisfy $xy = 551$ and $yz = 1073$. Find $x + y + z$.

Solution: Pairwise coprime and $xy = 551 = 19 \cdot 29$, $yz = 1073 = 29 \cdot 37 \Rightarrow y = 29, x = 19, z = 37$. Sum = 85. **Ans. 85.**

Q13. A 300 m long train, passes between two poles that are 100 m apart, in 36 seconds. Find its speed in km/h.

Solution: Distance to pass two poles 100m apart $= L + 100 = 300 + 100 = 400$m. Speed $= \dfrac{400}{36}$ m/s = 40 km/h. **Ans. 40.**

Q14. $2 + \cfrac{1}{5 + \cfrac{3-2}{4 + \cfrac{7}{8}}} = \dfrac{a}{b}$. Compute $(a + b - 600)$.

Solution:

$$2 + \frac{1}{5 + \frac{1}{4+\frac{7}{8}}} = 2 + \frac{1}{5 + \frac{1}{\frac{39}{8}}} = 2 + \frac{1}{5 + \frac{8}{39}} = 2 + \frac{1}{\frac{203}{39}} = 2 + \frac{39}{203} = \frac{445}{203}$$

$$a + b - 600 = 445 + 203 - 600 = \textbf{Ans. 48.}$$

Q15. Find the smallest two-digit number that gives a remainder 1 when divided by 3, 4, and 5.

Solution: LCM of $3, 4, 5 = 60$. Remainder $1 \Rightarrow$ number $= 60k + 1$. Smallest two-digit: $k = 1 \Rightarrow 61$. **Ans. 61.**

Q16. How many trailing zeros are there in 50!? (Use: $50! = 50 \times 49 \times \cdots \times 1$.)

Solution: To find the number of trailing zeros, we should find the number of times $10 = 5 \times 2$ appears in 50!. Since 5 appears 12 times as a factor here, hence 12 trailing zeros. **Ans. 12.**

Q17. Two pulleys are connected by a tight belt. Pulley A has radius 5 units, Pulley B has radius 3 units. If A completes 42 rotations, how many does B complete?

Solution: Belt: rotations $\propto$ inverse radius. $N_B = 42 \cdot \dfrac{5}{3} = 70$. **Ans. 70.**

Q18. What is the angle between the hour and minute hands of a clock at 3:20? If this angle equals $\dfrac{t}{2}^{\circ}$, find t.

Solution: At 3:20, hour hand $= 90^\circ + 20 \cdot 0.5^\circ = 100^\circ$; minute hand $= 120^\circ$. Angle $= 20^\circ = \frac{t}{2}^{\circ} \Rightarrow t = 40$. **Ans. 40.**

Q19. $\dfrac{\sqrt{1008} + \sqrt{720} + \sqrt[3]{5184}}{\sqrt{20} + \sqrt{28} + \sqrt[3]{24}} = ?$

Solution: $\dfrac{\sqrt{1008} + \sqrt{720} + \sqrt[3]{5184}}{\sqrt{20} + \sqrt{28} + \sqrt[3]{24}} = \dfrac{12\sqrt{7} + 12\sqrt{5} + 6\sqrt[3]{24}}{2\sqrt{5} + 2\sqrt{7} + \sqrt[3]{24}} = 6$. **Ans. 6.**

Q20. Two numbers differ by 20, and their product is 800. Find their sum.

Solution: Let the numbers be a, b. Numbers differ by 20, and product 800.
$(a+b)^2 = (a-b)^2 + 4ab = 400 + 3200 = 3600 \Rightarrow a + b = 60$. **Ans. 60.**

Q21. A mango doubles every minute in a basket. If the basket gets full in 30 minutes, how many minutes it took to be $\frac{1}{4}$ full?

Solution: Doubling each minute; full at 30 min $\Rightarrow$, $\frac{1}{2}$ at 29 min $\Rightarrow$ $\frac{1}{4}$ full at 28 min. **Ans. 28.**

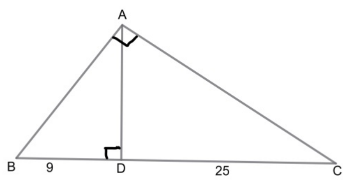
Q22. The inner circumference of a circular race track of width 14m is 440m. Find the radius of the outer track. (Use $\pi = \frac{22}{7}$.)

Solution: Inner circumference $= 440 = 2\pi r$ with $\pi = \frac{22}{7} \Rightarrow r = 70$. Outer radius $= r + 14 = 84$. **Ans. 84.**

Q23. A regular polygon has each interior angle 150°. Find the total number of diagonals.

Solution: Interior angle $150° = \dfrac{180(n-2)}{n} \Rightarrow n = 12$.
Number of ways in which two vertices can be joined in a 12-sided polygon $= \frac{12\times 11}{2} = 66$.
Number of diagonals $= 66 - 12$ (sides) $= 54$. **Ans. 54.**

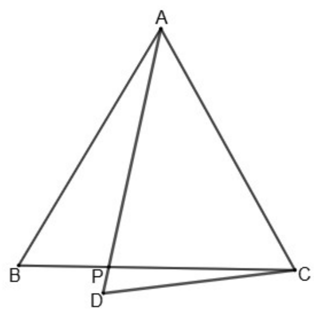
Q24.



In $\triangle ABC$, $A = 90°$, $\overline{AD} \perp \overline{BC}$. $BD = 9, DC = 25$, Find AD.

Solution: $AC^2 = AD^2 + 25^2, AB^2 = AD^2 + 9^2$
$\therefore AC^2 + AB^2 = 2 \cdot AD^2 + 625 + 81, \Rightarrow 34^2 = 2 \cdot AD^2 + 706$
$\Rightarrow AD = 15$ **Ans. 15.**

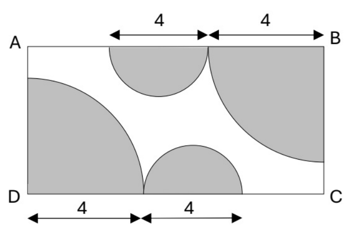
Q25.



$\triangle ABC$ is equilateral. $\triangle ADC$ is isosceles with $AD = AC$. If m$\angle DAC = 40°$, find m$\angle DCP$.

Solution: $m\angle B = 60°, m\angle BAP = 20°$
$\therefore$ Using EAT $m\angle APC = 80°$
$AD = AC, m\angle DAC = 40° \therefore m\angle ADC = 90 - \frac{40}{2} = 70°$
Using EAT $\triangle DPC$: $m\angle DCP = m\angle APC - m\angle DPC = 80 - 70 = 10°$. **Ans. 10.**

Q26.

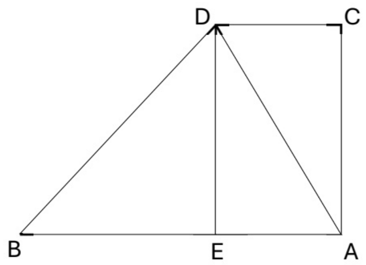


Given rectangle $ABCD$ with sides $AD = 5$ and $AB = 10$. If the area of the unshaded region is A, find $7A$.(Use $\pi = \frac{22}{7}$.) Shaded areas are quarter and semi-circles.

Solution: $[ABCD] = 10 \times 5 = 50$ sq. units.
Area of 2 quarter circles (shaded) $= 2 \times \frac{\pi \cdot 4^2}{4} = 8\pi$
Area of 2 semicircles (shaded) $= 2 \times \frac{\pi \times 2^2}{2} = 4\pi$

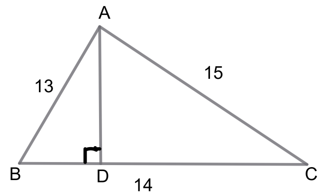
$\therefore$ Un-shaded Area $(A) = 50 - (8\pi + 4\pi) = 50 - 12 \times \frac{22}{7}$ $\therefore A = \frac{350-264}{7} = \frac{86}{7}$
$\therefore \quad 7A = 86$ sq. units. **Ans. 86.**

Q27.



In the figure, $\square ACDE$ is a rectangle. If $AB = 14$, $AD = 13$ and $DC = 5$, find BD.
Solution: Given $DC = AE = 5, AB = 14, AD = 13$
$\therefore BE = 9$,
Using PT $\triangle AED \Rightarrow DE = 12$
Using PT $\triangle BED \Rightarrow BD = 15$. **Ans. 15.**

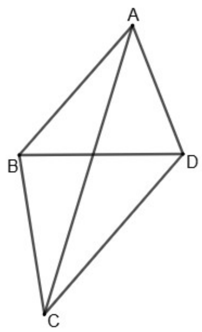
Q28.



Find the length of altitude $\overline{AD}$, given $AB = 13$, $BC = 14$, $AC = 15$.

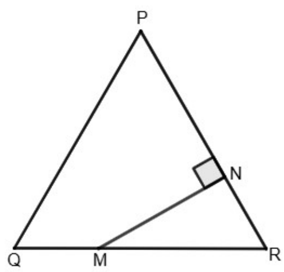
Solution: Heron: $s = \frac{13+14+15}{2} = 21$, area $= \sqrt{21 \times 8 \times 7 \times 6} = 84$.
Altitude $AD = \dfrac{2 \times 84}{14} = 12$. **Ans. 12.**

Q29.



In $\triangle ABC$, given $AB = BC = BD$, m$\angle BCA = 26°$, m$\angle BDA = 66°$, find $\angle ACD$.
Solution: From given information, $m\angle BAC = 26° \Rightarrow m\angle CAD = 40°$
$\Rightarrow m\angle ABD = 48°. \Rightarrow m\angle CBD = 80°$
$m\angle BCD = 90° - \frac{80}{2} = 50° \Rightarrow m\angle ACD = 50° - 26° = 24°$. **Ans. 24.**

Q30.



$\triangle PQR$ is an equilateral triangle, $MN \perp PR$.
If $PN = 11, QM = 5$, find PQ.
Solution: Given, $QM = 5, PN = 11$ Let $PQ = x$,
$\therefore MR = x - 5, NR = x - 11$
Draw $\overline{MK}$ such that $MK = MR = x - 11$
$\therefore \triangle MKR$ is equilateral and N is midpoint of $\overline{KR}$
hence $KR = x - 5$ and $KN = KR - NR = (x - 5) - (x - 11) = 6$
$\therefore PQ = PR = PK + KN + NR = 5 + 6 + 6 = 17$. **Ans. 17.**