M. Prakash Institute **STD VIII - Entrance Test 2**
25 January 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.	48	80	30	30	81	24	23	80	09	24
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	45	12	03	68	36	22	8	12	80	57
Ques.	21	22	23	24	25	26	27	28	29	30
Ans.	46	33	07	80	82	12	12	20	34	50

Q1. When $\frac{1}{3}^{\text{rd}}$ of a number is multiplied by $\frac{1}{8}^{\text{th}}$ of the same number, we get 96 , find the number.

Solution: let the number be x, so we have $\left(\frac{1}{3}x\right) \times \left(\frac{1}{8}x\right) = 96 \Rightarrow x^2 = 96 \times 3 \times 8 = 2304 \Rightarrow x = 48$ **Ans. 48.**

Q2. Find the value of m^2 if $m = \dfrac{(\sqrt{5}+2)^2 - (\sqrt{5}-2)^2}{2}$

Solution: $m = \frac{(\sqrt{5}+2)^2-(\sqrt{5}-2)^2}{2} = \frac{(\sqrt{5}+2+\sqrt{5}-2)(\sqrt{5}+2-\sqrt{5}+2)}{2} = \frac{2\sqrt{5}\times 4}{2} = 4\sqrt{5} \Rightarrow m^2 = 80.$ **Ans. 80.**

Q3. Simplify and find the value of m if $\dfrac{\frac{7}{2} \div \frac{5}{2} \times \frac{3}{2}}{\frac{7}{2} \div \left(\frac{5}{2} \text{ of } \frac{3}{2}\right)} \div 5.25 = m \div 70$

Solution: $\dfrac{\frac{7}{2} \div \frac{5}{2} \times \frac{3}{2}}{\frac{7}{2} \div \left(\frac{5}{2} \text{ of } \frac{3}{2}\right)} \div 5.25 = m \div 70 \Rightarrow \dfrac{\frac{7}{2} \times \frac{2}{5} \times \frac{3}{2}}{\frac{7}{2} \div (\frac{5}{2} \times \frac{3}{2})} \div \dfrac{525}{100} = \dfrac{\frac{7}{2} \times \frac{2}{5} \times \frac{3}{2} \times (\frac{5}{2} \times \frac{3}{2})}{\frac{7}{2}} \times \dfrac{100}{525} = \dfrac{m}{70}$
$\Rightarrow m = 30.$ **Ans. 30.**

Q4. Arun bought some toys at a discount of 20% on the original price. The original price of each toy is Rs 40 . If he makes total saving of Rs. 240, how many toys did he buy?

Solution: 20% discount on original price of 40 Rs. means Rs. 8 per toy. Total savings is 240 Rs. so number of toys is $240 \div 8 = 30$. **Ans. 30.**

Q5. Observe the pattern.

$$11^2 = 121$$
$$111^2 = 12321$$
$$1111^2 = 1234321$$

And so on. . . . . .
Here, if we say, sum of the digits of the number in second row, we mean, sum of the digits of 12321, which is $1 + 2 + 3 + 2 + 1 = 9$.
Find the sum of digits of the number in 8th row.

Solution:

First row : $11^2 = 121$
Second row : $111^2 = 12321$
Eighth row : $111111111^2 = 12345678987654321$

$$\begin{aligned}\text{Sum of digits } &= 9 + 2(1+2+3+4+5+6+7+8)\\ &= 9 + \frac{2\times 8\times 9}{2}\\ &= 9 + 72\\ &= 81\end{aligned}$$

Ans. 81.

Q6. The average of 20 numbers is 56 . Out of the given numbers, one is 8 more than the other number and average of remaining 18 numbers is 60. Find the larger of the two numbers.

Solution: Sum of 20 nos $= 56 \times 20 = 1120$
Sum of 18 nos $= 18 \times 60 = 1080$
$x, x+8$

$$\begin{aligned}x + x + 8 &= 1120 - 1080\\ 2x + 8 &= 40\\ 2x &= 32\\ x &= 16\\ x + 8 &= 24\end{aligned}$$

Ans. 24.

Q7. Find the least number which should be added to 2497 so that the sum is exactly divisible by $5, 6, 4$ and 3.

Solution:

$$\begin{aligned}\text{LCM}(5,6,4,3) &= 60\\ \frac{2497}{60} &\approx 41\end{aligned}$$

We need least number to be added so, number divisible > 2497

$$\begin{aligned}&\Rightarrow 60 \times 42 = 2520\\ &\Rightarrow \text{ Required } Number = 2520 - 2497 = 023\end{aligned}$$

Ans. 23.

Q8. The ratio of the number of boys and girls in a school of 480 students is 7:5. How many more girls should be admitted to make the ratio 1 : 1 ?

Solution: Boys $= \frac{7}{12} \times 480 = 280$ Girls $= \frac{5}{12} \times 480 = 200$
To make the ratio 1 : 1, no. of boys = no. of girls. $\Rightarrow$ No. of girls to be added $= 280 - 200 = 80$.
Ans. 80.

Q9. Find the digit in the unit's place of $(2027)^{2026}$

Solution: Unit's place digit for the powers of 7, $7^1 \Rightarrow 7, 7^2 \Rightarrow 9, 7^3 \Rightarrow 3, 7^4 \Rightarrow 1, 7^5 \Rightarrow 7$
After every 4^{th} power last digit would repeat in a sequence as 7,9,3,1.
$2026 = 506 \times 4 + 2$, Remainder is 2. Hence second in the group i.e. 9 would be at the unit's place.
Ans. 9.

Q10. $\frac{\sqrt{3}+\sqrt{27}}{\sqrt{2}}$ can be expressed in the form $\sqrt{k}$ where k is an integer. Find the value of k.

Solution: $\frac{\sqrt{3}+\sqrt{27}}{\sqrt{2}} = \sqrt{k} \Rightarrow \frac{4\sqrt{3}}{\sqrt{2}} = \sqrt{k} \Rightarrow \quad 2\sqrt{6} = \sqrt{k} \Rightarrow \quad k = 24$ **Ans. 24.**

Q11. The ratio of two numbers is 4 : 5. If 6 is subtracted from first number and 5 is added to second number the ratio of resulting number is 3 : 5. Find the greater number.

Solution: $\frac{4x-6}{5x+5} = \frac{3}{5} \Rightarrow 5(4x-6) = 3(5x+5) \Rightarrow x = 9$
Greater no. $= 5x = 5 \times 9 = 45$ **Ans. 45.**

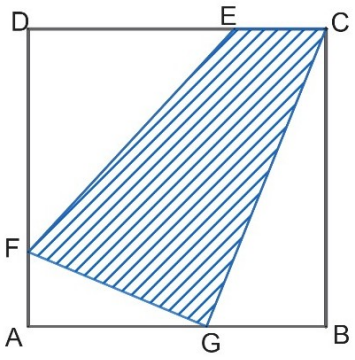
Q12. If $6^{x-y} = 36$ and $3^{x+y} = 729$, then find $x^2 - y^2$

Solution: $6^{x-y} = 36 \Rightarrow 6^{x-y} = 6^2 \Rightarrow x - y = 2$ $\quad 3^{x+y} = 729 \Rightarrow 3^{x+y} = 3^6 \Rightarrow x + y = 6$
$x^2 - y^2 = (x+y)(x-y) = 2 \times 6 = 12$ **Ans. 12.**

Q13. In 1 hour, A walks twice the distance that B walks. In 5 hours, A walks 6 miles more than what B walks in 8 hours. How many miles does B walk per hour?

Solution: Suppose B walks x miles per hour. So, B walks $8x$ miles in 8 hours. So, A walks $8x + 6$ miles in 5 hours. So, speeds of A and B per hour are $\frac{8x+6}{5}$ and x. Since A walks twice the distance that B walks in one hour, speed of A is twice that of B. So, we have, $2x = \frac{8x+6}{5} \Rightarrow 8x + 6 = 10x \Rightarrow x = 3$.
Ans. 3.

Q14.



$\square ABCD$ is a square. AF = CE = 4 cm, BG = 5 cm and BC = 12 cm. Find the area of the shaded region.

Solution:

$$[CEFG] = [ABCD] - \{[AFG] + [BCG] + [DEF]\}$$
$$= 12^2 - \left\{\frac{1}{2} \times 4 \times 7 + \frac{1}{2} \times 12 \times 5 + \frac{1}{2} \times 8 \times 8\right]$$
$$= 144 - 76$$
$$= 68 \text{ cm}^2$$

Ans. 68.

Q15. $a + b = 14 \quad ab = 40 \quad$ Find $(a-b)^2$.

Solution: $(a-b)^2 = (a+b)^2 - 4ab = 14^2 - 4(40) = 36$. **Ans. 36.**

Q16. If the value of the polynomial $x^4 + 2x^3 - 3x^2 + mx - 11$ at $x = -2$, is 21 , then find the value of $(-m)$.

Solution: $p(-2) = (-2)^4 + 2(-2)^3 - 3(-2)^2 + m(-2) - 11$
$= 16 - 16 - 12 - 2m - 11 = -2m - 23 \Rightarrow -2m - 23 = 21 \Rightarrow \quad -m = 22$ **Ans. 22.**

Q17. If 2 men or 3 boys take 40 hours to do a certain piece of work, how long will 4 men and 9 boys working together take to complete the work?

Solution: One man will complete the work in 80 hours, so every hour he completes $\frac{1}{80}$ part of work. Similarly every boy completes $\frac{1}{120}$ part of work in one hour.
So, in one hour, 4 men and 9 boys will complete $\frac{4}{80} + \frac{9}{120} = \frac{1}{8}$ part of work in one hour. So, they will complete the work in 8 hours. **Ans. 8.**

Q18. Interest received from a sum of Rs. 12,250 at the end of 4 years at a certain rate of simple interest is Rs. 840 more than the interest received from another sum of Rs. 21,000 at the end of 2 years at the same rate of simple interest. Find rate percent.

Solution: Suppose the rate of interest is r per cent per annum.
So, $\frac{12250 \times 4 \times r}{100} - \frac{21000 \times 2 \times r}{100} = 840 \Rightarrow r\,(7000) = 84000 \Rightarrow r = 12$. **Ans. 12.**

Q19. A bakery sold 18 cakes for Rs. 1840. Profit equivalent to costprice of 5 cakes was made. What was the costprice of each cake?

Solution: Suppose the cost price of each cake is C. So, $1840 - 18C = 5C \Rightarrow 1840 = 23C \Rightarrow C = 80$. **Ans. 80.**

Q20. A public parking lot has a total parking capacity of 130 vehicles alloted only for cars (4 -wheelers) and auto-rickshaws (3 -wheelers). On a given day when the parking was full, the total number of wheels were 463 . How many auto-rickshaws were parked there?

Solution: Suppose there are C cars and R rikshaws. So, we have $C + R = 130$ and $4C + 3R = 463$. Replacing C by $130 - R$ in the second equation, we get $4(130 - R) + 3R = 463 \Rightarrow R = 57$. **Ans. 57.**

Q21. Ten years ago father's age was three times that of the son. Ten years hence ratio of father's age to that of son's age would be $7 : 4$. Find father's present age.

Solution: Suppose, ten years ago, son's age was x and father's age was $3x$. So, ten years hence, their ages are $x + 20, 3x + 20$. So, we have $\frac{3x + 20}{x + 20} = \frac{7}{4} \Rightarrow 12x + 80 = 7x + 140 \Rightarrow x = 12$. Father's present age is $3x + 10 = 46$. **Ans. 46.**

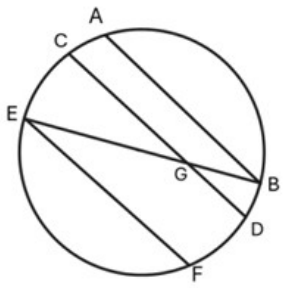
Q22. In a 8^{th} std class, 22 students play football and 16 students play basketball. There are 5 students who play both the games. How many students are there in this class if everyone of them is playing atleast one game?

Solution: Number of students $= 22 + 16 - 5 = 33$. **Ans. 33.**

Q23. A boat takes 4 hours to travel 60 km upstream and 3 hours to travel 60 km downstream. If the ratio of the speed of boat in still water and the speed of stream is $x : 1$ then x=?

Solution: Suppose the speed of stream is $k$km/hr and hence speed of boat is kxkm/hr. So, we have $kx - k = 15$ and $kx + k = 20 \Rightarrow kx = \frac{35}{2}, k = \frac{5}{2} \Rightarrow x = 7$. **Ans. 7.**

Q24.



Chords $\overline{AB}, \overline{CD}$ and $\overline{EF}$ are parallel to each other. $m\angle EGD = 140$. Find $m(\text{arc}\,ACE)$.
Solution: O is the centre of the circle
$m\angle EGC = 40^\circ$ ____ Linear pair with 140°.
$\overline{AB} \| \overline{CD}$ and $\overline{BE}$ is transversal
$\Rightarrow m\angle ABE = 40^\circ$
$m\angle AOE = 2m\angle ABE = 80^\circ$.
$m(\text{arc}\,ACE) = m\angle AOE = 80^\circ$
Ans: 80

Q25.

$x = 50$	$y = 10$	$z = 2$
$x = 20$	$y = 4$	$z = 5$
$x =$	$y = 2.5$	$z =$

Study the variation between x and y, & between x and z in the first two rows. Applying the same variation in 3^{rd} row, find the value of $\frac{10(x+z)}{y}$

Solution: $\frac{x}{y} = \frac{5}{1} \Rightarrow \frac{x}{2.5} = \frac{5}{1} \Rightarrow x = 12.5$
$xz = 100 \Rightarrow 12.5 \times z = 100 \Rightarrow z = 8$
$\frac{10(x + z)}{y} = \frac{10(12.5 + 8)}{2.5} = 82$. **Ans. 82.**

Q26. 6 is mean proportion between two numbers x and y and 48 is third proportion to x and y. Find the larger of the two numbers.

Solution: $6^2 = xy \Rightarrow x = \dfrac{36}{y} \Rightarrow y^2 = 48x \Rightarrow y^2 = 48 \times \dfrac{36}{y} \Rightarrow y^3 = 36 \times 48 \Rightarrow y = 12$

$\Rightarrow x = \dfrac{36}{y} = \dfrac{36}{12} = 3$. **Ans. 12.**

Q27. In $\triangle ABC$, if $AB = 12, BC = 4\sqrt{3}, AC = 8\sqrt{3}$ and if BD is perpendicular to segment AC, Find $2(BD)$.

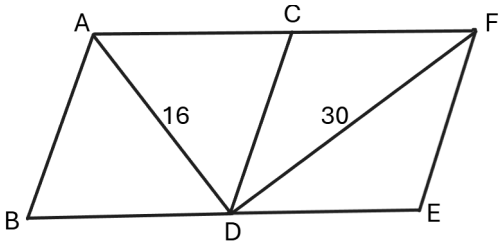
Solution:

$$\begin{aligned} & AC = 2BC \text{ and } AB = \sqrt{3}BC \\ \Rightarrow & \triangle ABC \text{ has } \angle A = 30^\circ, \angle B = 90^\circ, \angle C = 60^\circ \\ & \overline{BD} \perp \overline{AC} \\ \text{In } & \triangle BCD, \angle D = 90^\circ, \angle C = 60^\circ \\ \Rightarrow & \angle DBC = 30^\circ \\ \Rightarrow & 2(BD) = \sqrt{3}BC \\ & = \sqrt{3} \times 4\sqrt{3} \\ & = 12. \quad \textbf{Ans. 12.} \end{aligned}$$

Q28. Tiya eats 10 panipuries in 3 mins 20 seconds, while Siya eats 16 panipuries in 6 min 40 sec. If they both eat together, then in how many minutes will they finish a box of 108 panipuries?

Solution: Tiya eats $\frac{1}{20}$ panipuri in one second and Siya eats $\frac{1}{25}$ panipuri in one second. So, they together eat $\frac{1}{20} + \frac{1}{25} = \frac{9}{100}$ panipuri in one second. So, they need $\dfrac{108}{\frac{9}{100}} = 1200$ seconds $= 20$ minutes to eat 108 panipuris. **Ans. 20.**

Q29.



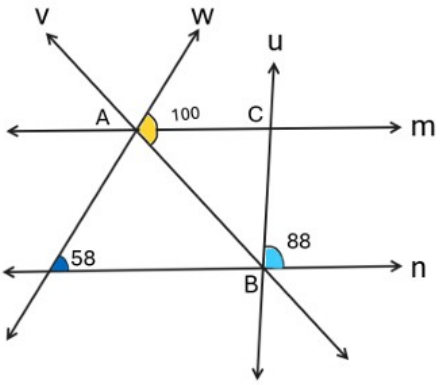
Two congruent Rhombii are placed alongside as shown in figure. Diagonal AD is 16 units while diagonal $\overline{DF}$ is 30 units. If the Perimeter of the total figure is $3P$, Find P.

Solution:

$$\begin{aligned} \angle ADF &= 90^\circ \\ AF^2 &= 16^2 + 30^2 \\ \Rightarrow AF &= 34 \\ \Rightarrow AC &= 17 \\ \text{Perimeter } \square ABEF &= 2(17 + 34) \\ \Rightarrow 3P &= 2 \times 51 \\ \Rightarrow P &= 34 \end{aligned}$$

Ans. 34.

Q30.



Line m is parallel to line n. Lines v, w and m are concurrent at A; while lines u, v and n are concurrent at B. Find $m\angle ABC$.

Solution:

$$\begin{aligned} \angle WAC &= 58^\circ \quad \text{corresponding angle with } 58^\circ \\ \angle CAB &= 100^\circ - 58^\circ = 42^\circ \quad \text{Adjacent angles.} \\ \Rightarrow \quad \angle ABD &= 42^\circ \\ \angle ABC &= 180^\circ - (88 + 42)^\circ \\ &= 50^\circ \end{aligned}$$

Ans. 50.