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**Logical Reasoning Tricks and Techniques for**

**Exam: IAS, PCS, UPSC, Bank PO, NDA, RRB, SSC, Indian Air Force, Etc.**

### **VERBAL REASONING DATA SUFFICIENCY (ENGLISH)**

**Q1: In a class of 40 students, John is ranked 15th from the top. What is his rank from the bottom?**

**Long Method:** To determine John's rank from the bottom, we first need to understand the ranking system. If John is 15th from the top in a class of 40 students, this means there are 14 students ranked higher than him. Since the total number of students is 40, we subtract the number of students ranked higher than John from the total number of students, then add one (because John is included in the total number). Therefore, his rank from the bottom is  $40 - 14$ , which gives us 26.

**Short Method:** To find the rank from the bottom, subtract John's rank from the total number of students and add 1:  $40 - 15 + 1 = 26$

**Q2: The ratio of the ages of two friends is 5:7. If the sum of their ages is 48, what are their ages?**

**Long Method:** Let the ages of the two friends be  $5x$  and  $7x$ . According to the problem, the sum of their ages is 48. So, we have the equation:  $5x + 7x = 48$   
 $12x = 48$   
 $x = 4$   
Thus, the ages are:  $5x = 5 \times 4 = 20$  and  $7x = 7 \times 4 = 28$

**Short Method:** Sum of ratio parts =  $5 + 7 = 12$ . Divide total age by sum of ratio parts:  $48 \div 12 = 4$   
Ages are  $5 \times 4 = 20$  and  $7 \times 4 = 28$ .

**Q3: A train travels at a speed of 60 km/h and covers a certain distance in 5 hours. What is the distance covered by the train?**

**Long Method:** The distance covered by the train can be found using the formula:

Distance = [Speed  $\times$  Time]

Substitute the given values: Distance = [60 km/h  $\times$  5 hours]

Distance = 300 km

**Short Method:** Multiply speed by time:  $60 \times 5 = 300$  km

**Q4: If the perimeter of a rectangle is 60 meters and the length is twice the width, what are the dimensions of the rectangle?**

**Long Method:** Let the width be  $w$ . Then the length  $l$  is  $2w$ . The perimeter  $P$  of a rectangle is given by:  
 $P = 2l + 2w$

Substituting the given values:  $60 = 2(2w) + 2w$ :  $60 = 4w + 2w$ :  $60 = 6w$

Solving for  $w$ :  $w = 60/6 = 10$  Thus, the length is:  $l = 2w = 2 \times 10 = 20$

**Short Method:** Solve for width by dividing perimeter by total width parts:  $60 = 2(2w + w)$   
 $\rightarrow 60 = 6w \rightarrow w = 10$ : Length is  $2 \times 10 = 20$

**Q5: If the average of four numbers is 20 and three of the numbers are 18, 22, and 19, what is the fourth number?**

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**Long Method:** Let the four numbers be  $a, b, c, d$ . Given the average is 20, the sum of the four numbers is:  $4 \times 20 = 80$ . Three of the numbers are given as 18, 22, and 19. So, we find the fourth number by subtracting the sum of these three from the total sum:  $80 - (18 + 22 + 19) = 80 - 59 = 21$

**Short Method:** Sum needed for average =  $80 = 80$ . Subtract known sum from total:  $80 - (18 + 22 + 19) = 21$

**Q6: If  $x + y = 10$  and  $x - y = 4$ , what are the values of  $x$  and  $y$ ?**

**Long Method:** We can solve this system of equations by adding and subtracting the equations. Adding the equations:  $(x+y) + (x-y) = 10+4$ :  $(2x=14)$ :  $2x=14$ ;  $x=7$

Now, substitute  $x=7$  into  $x+y=10$ :  $7+y=10$ :  $y=3$

**Short Method:** Add the equations to find  $x$ :  $2x=14 \rightarrow x=7$ . Subtract to find  $y$ :  $x-y=4 \rightarrow 7-y=4 \rightarrow y=3$ .

**Q7: The price of a book was first increased by 10% and then decreased by 10%. What is the final price if the original price was \$100?**

**Long Method:** First, increase the original price by 10%:  $\text{New Price} = 100 + (0.10 \times 100) = 100 + 10 = 110$

$\text{New Price} = 100 + (0.10 \times 100) = 100 + 10 = 110$

Next, decrease this new price by 10%:

$\text{Final Price} = 110 - (0.10 \times 110) = 110 - 11 = 99$

**Short Method:** Apply both percentage changes:  $100 \times 1.10 \times 0.90 = 99$

**Q8: A car travels 150 km at a speed of 50 km/h and returns at 75 km/h. What is the average speed for the entire trip?**

**Long Method:** First, find the time for each part of the trip:  $\text{Time forward} = 150/50 = 3$  hours

$\text{Time return} = 150/75 = 2$  hours:  $\text{distance} = 150 \text{ km} + 150 \text{ km} = 300 \text{ km}$ .  $\text{Total time} = 3 \text{ hours} + 2 \text{ hours} = 5$  hours.

Average speed is:  $\text{Average Speed} = [\text{Total Distance}] / [\text{Total Time}] = [300 \text{ km} / 5 \text{ hours}] = 60 \text{ km/h}$

**Short Method:** Total distance = 300 km, total time = 5 hours.  $\text{Average speed} = 300/5 = 60 \text{ km/h}$

**Q9: If 5 workers can complete a task in 8 days, how long will it take 10 workers to complete the same task?**

**Long Method:** Calculate the total amount of work in worker-days. 5 workers for 8 days:

$5 \times 8 = 40$  worker-days: Now, divide the total work by the number of workers:  $[40 \text{ worker-days}] / [10 \text{ workers}] = 4$  days

**Short Method:** Halve the number of workers, halve the time:  $8 \div 2 = 4$  days

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**Q10: The area of a triangle is 50 square meters and the base is 10 meters. What is the height of the triangle?**

**Long Method:** Use the area formula for a triangle:  $\text{Area} = \frac{1}{2} \times [\text{Base} \times \text{Height}]$

Substitute the known values:  $50 = \frac{1}{2} \times [10 \times \text{Height}]$ :  $50 = 5 \times \text{Height}$  Solve for height:

Height =  $50/5 = 10$  meter

**Short Method:** Rearrange the area formula and solve: Height =  $2 \times [50/10] = 10$  meters

**Q11: If  $\frac{3}{4}$  of a number is 12, what is the number?**

**Long Method:** Let the number be  $x$ . Then:  $\frac{3}{4}x = 12$ .

To solve for  $x$ , multiply both sides by the reciprocal of  $\frac{3}{4}$ :  $x = 12 \times [\frac{4}{3}]$ :  $x = 16$

**Short Method:** Multiply 12 by  $\frac{4}{3}$ :  $[\frac{4}{3}] * 12 = 16$

**Q12: If the sum of three consecutive even numbers is 54, what are the numbers?**

**Long Method:** Let the three consecutive even numbers be  $x$ ,  $x+2$ , and  $x+4$  Their sum is:

$x + (x+2) + (x+4) = 54$ :  $3x + 6 = 54$ :  $3x = 54 - 6$ :  $3x = 48$ :  $3x = 48$   $x = 16$ .

Thus, the numbers are: 16, 18, 20

**Short Method:** Divide the sum by 3 to find the middle number:  $54/3 = 18$ . So, the numbers are 16, 18, and 20.

**Q13: A person spends 40% of their income on rent and 30% on food. If they spend \$700 on rent, what is their total income?**

**Long Method:** Let the total income be  $x$ . According to the problem:  $0.40x = 700$ :  $40x = 700$  To find  $x$ , divide both sides by 0.40:  $x = [700/0.40]$ :  $x = 1750$

**Short Method:** Divide the rent by the percentage spent on rent:  $700/0.40 = 1750$ .

**Q14: The average of five numbers is 30. If one of the numbers is 40, what is the average of the remaining four numbers?**

**Long Method:** First, find the total sum of the five numbers: Total sum =  $5 \times 30 = 150$ : Subtract the known number (40) from the total sum:  $150 - 40 = 110$  Now, find the average of the remaining four numbers:

Average =  $110/4 = 27.5$  Average = 27.5

**Short Method:** Subtract the number from the total average sum and divide by remaining numbers:  $[150 - 40]/4 = 27.5$

**Q15: The circumference of a circle is 44 meters. What is the radius?**

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**Long Method:** The formula for circumference is:  $C=2\pi r$ :  $C=2\pi r$  Given  $C=44$ :  $44=2\pi r$ : Solve for  $r$ :  
 $r=44/[2\pi r]$ :  $[r=44/[2\times 3.14r]]$ :  $r=7$  meters

**Short Method:** Divide circumference by  $2\pi$ :  $44/6.28=7$  meters

**Q16: If 6 men can paint a house in 12 days, how long will it take 8 men to paint the same house?**

**Long Method:** First, find the total man-days required:  $6\times 12=72$  man-days

Now, divide by the number of men:  $72/8=9$  days

**Short Method:** Inverse proportion: fewer days with more men:  $[6/8]\times 12=9$  days

**Q17: If  $x/3=5$  what is the value of  $x$ ?**

**Long Method:** Multiply both sides by 3:  $x=5\times 3$ :  $x=5\times 3$   $x=15$

**Short Method:** Multiply 5 by 3:  $5\times 3=15$

**Q18: The sum of two numbers is 90 and their difference is 30. What are the numbers?**

**Long Method:** Let the numbers be  $x$  and  $y$ :  $x+y=90$ :  $x-y=30$

Add the equations:  $2x=120$ :  $x=60$  Now substitute  $x$  back:  $60+y=90$ :  $y=30$

**Short Method:** Add and subtract the given sums:  $[90+30]/2=60$ :  $x=60$ :  $y=90-60=30$

**Q19: If the product of two numbers is 120 and one of the numbers is 10, what is the other number?**

**Long Method:** Let the other number be  $x$ :  $10\times x=120$ :  $10\times x=120$  Solve for  $x$ :  
 $x=12$

**Short Method:** Divide the product by the known number:  $120/10=12$

**Q20: If a number is divided by 6, the quotient is 7 and the remainder is 4. What is the number?**

**Long Method:** Let the number be  $x$ . According to the division algorithm:  $x=[6\times 7]+4$ :  $x=46$

**Short Method:** Multiply the quotient by the divisor and add the remainder:  $[6\times 7]+4=46$

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**Q21: The length of a rectangle is twice its width. If the perimeter is 60 meters, what are the dimensions?**

**Long Method:** Let the width be  $w$  and the length be  $2w$ . The perimeter  $P$  is:  $2(l+w)=60$  Substitute the length:  $2(2w+w)=60:w=10$  Thus, the length is:  $2w=20$

**Short Method:** Divide the perimeter parts by total parts (6):  $60/6=10$ : Length is  $2 \times 10=20$ .

**Q22: If 15% of a number is 45, what is the number?**

**Long Method:** Let the number be  $x$ :  $0.15x=45$ :  $x=45/0.15$ :  $x=300$

**Short Method:** Divide 45 by  $45/0.15=300$

**Q23: If the present age of a father is three times that of his son and their ages differ by 24 years, what are their ages?**

**Long Method:** Let the son's age be  $x$  and the father's age be  $3x$ :  $3x-x=24$   $2x=24$   $x=12$  So, the son's age is 12 and the father's age is:  $3 \times 12=36$

**Short Method:** Divide the age difference by the age ratio difference:  $24=2x$   $x=12$  Son is 12, father is  $3 \times 12=36$

**Q24: If a square has an area of 64 square meters, what is the length of one side?**

**Long Method:** The area  $A$  of a square is given by:  $A=s^2$  Given  $A=64$ :  $s^2=64$ :  $s=\sqrt{64}$ :  $s=8$

**Short Method:** Take the square root of the area:  $\sqrt{64}=8$  meters

**Q25: The difference between the squares of two consecutive integers is 21. What are the integers?**

**Long Method:** Let the integers be  $n$  and  $n+1$ :  $(n+1)^2-n^2=21$   
 $n^2+2n+1-n^2=21$ : Solving for  $n$  we get,  $n=10$ . Thus, the integers are 10 and 11.

**Short Method:** Use the difference of squares:  $2n+1=21 \rightarrow n=10$

**Q26: A person walks at a speed of 5 km/h and covers a distance in 3 hours. What is the distance?**

**Long Method:** The distance covered can be found using the formula: Distance=[Speed×Time];

Distance= [[5 km/h]×3 hours]: Distance =15 km

**Short Method:** Multiply speed by time:  $5 \times 3=15$  km

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**Q27: If the sum of the interior angles of a polygon is 720 degrees, how many sides does the polygon have?**

**Long Method:** The formula for the sum of the interior angles of a polygon with  $n$  sides is:  $(n-2) \times 180 = 720$ : Solving for  $n$ :  $(n-2) \times 180 = 720$ :  $n = 6$

**Short Method:** Divide the sum of the angles by 180 and add 2:  $[720/180] + 2 = 4 + 2 = 6$

**Q28: A certain number when divided by 8 gives a quotient of 6 and a remainder of 5. What is the number?**

**Long Method:** Let the number be  $x$ . According to the division algorithm:  $[x = [8 \times 6] + 5]$ :  $x = 53$

**Short Method:** Multiply the quotient by the divisor and add the remainder:  $[8 \times 6 + 5] = 53$

**Q29: The cost price of an article is \$200, and it is sold at a profit of 15%. What is the selling price?**

**Long Method:** The selling price can be calculated using the formula:

Selling Price =  $[\text{Cost Price} + (\text{Profit Percentage} \times \text{Cost Price})]$

Selling Price =  $200 + (0.15 \times 200)$

Selling Price =  $200 + 30$ : Selling Price = 230

**Short Method:** Multiply the cost price by 1 plus the profit percentage:  $[200 \times 1.15] = 230$

**Q30: If the ratio of boys to girls in a class is 3:4 and there are 35 students, how many boys are there?**

**Long Method:** Let the number of boys be  $3x$  and the number of girls be  $4x$ . The total number of students is:  $3x + 4x = 35$ :  $x = 5$  Thus, the number of boys is:  $3x = 3 \times 5 = 15$

**Short Method:** Divide the total students by the sum of the ratio parts and multiply by the number of parts for boys:  $[35/7] \times 3 = 15$

**Q31: A boat travels downstream at 6 km/h and upstream at 4 km/h. What is the speed of the current?**

**Long Method:** Let the speed of the boat in still water be  $b$  and the speed of the current be  $c$ . The downstream speed is  $b+c$  and the upstream speed is  $b-c$ . Given:  $b+c=6$ :  $b-c=4$ .

Add the equations to eliminate  $c$ :  $2b=10$ :  $b=5$  Substitute  $b$  back into the equation:  $5+c=c=1$

**Short Method:** Average the downstream and upstream differences:  $[6-4]/2 = 2/2 = 1$

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**Q32: The product of the digits of a two-digit number is 18. If the tens digit is twice the units digit, what is the number?**

**Long Method:** Let the tens digit be  $2x$  and the units digit be  $x$ .

According to the problem:  $2x \times x = 18$ :  $2x^2 = 18$ :  $x = 3$  Thus, the number is:  $2x = 2 \times 3 = 6$ . The number is 63

**Short Method:** Solve the simple quadratic equation:  $x = 3$  Tens digit is twice the unit digit, so the number is 63.

**Q33: If 60% of a number is 150, what is the number?**

**Long Method:** Let the number be  $x$ . According to the problem:  $0.60x = 150$ : Solve for  $x$ :  $x = 150$ :

$0.60x = 150 / 0.6$   $x = 250$

**Short Method:** Divide 150 by 0.60:  $150 / 0.60 = 250$

**Q34: A rectangle has a length that is 4 meters more than its width. If the area is 96 square meters, what are the dimensions?**

**Long Method:** Let the width be  $w$  and the length be  $w+4$ . According to the problem:  $w(w+4) = 96$ :

$w^2 + 4w - 96 = 0$ :

Solve the quadratic equation using the quadratic formula  $w = [-b \pm \sqrt{b^2 - 4ac}] / 2a$ .

.On solving, we get  $w = 8$  (ignoring the negative root) Length is:  $w+4 = 12$ :  $w = 8$ : Length =  $8+4 = 12$

**Short Method:** Use quadratic root approximation or guess and check:  $w = 8$  and  $l = 12$

**Q35: The perimeter of a square is 48 meters. What is the area?**

**Long Method:** The perimeter  $P$  of a square with side  $s$  is:  $P = 4s$ :  $48 = 4s$ .

Solve for  $s = 48 / 4 = 12$ : The area  $A$  is:  $A = s^2$ :  $A = 12^2 = 144 \text{ m}^2$

**Short Method:** Divide the perimeter by 4 to find the side, then square it:  $(48/4)^2 = 144 \text{ m}^2$

**Q36: If 25% of a number is 80, what is the number?**

**Long Method:** Let the number be  $x$ . According to the problem:  $0.25x = 80$ : Solve for  $x$ :  $x = 80 / 0.25$ :

$x = 320$

**Short Method:** Divide 80 by 0.25:  $80 / 0.25 = 320$ .

**Q37: A man can row 30 km downstream in 3 hours and the same distance upstream in 5 hours. What is the speed of the man in still water?**

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**Long Method:** Let the speed of the boat in still water be  $b$  and the speed of the current be  $c$ . The downstream speed is  $b+c$  and the upstream speed is  $b-c$ . Given:  $30 \div 3 = b+c$ :  $b+c=10$  km/h:  $\therefore 30 \div 5 = b-c$ :  $30 \div 5 = b-c$ :  $b-c=6$  km/h. Add the equations:  $2b=16$ :  $b=8$

**Short Method:** Average the downstream and upstream speeds:  $[10+6] \div 2 = 8$  km/h.

**Q38: If the cost of 15 pens is \$45, what is the cost of 7 pens?**

**Long Method:** First, find the cost per pen: Cost per pen =  $45/15 = 3$  dollars. Then, find the cost of 7 pens: Cost of 7 pens =  $7 \times 3 = 21$  dollars.  
Cost of 7 pens = 21 dollars

**Short Method:** Multiply the cost per pen by 7:  $7 \times 3 = 21$  dollars.

**Q39: If the average of four numbers is 25 and the average of three of these numbers is 20, what is the fourth number?**

**Long Method:** First, find the total sum of the four numbers:  $4 \times 25 = 100$ . Next, find the total sum of the three numbers:  $3 \times 20 = 60$ . Subtract the sum of the three numbers  $100 - 60 = 40$ .

**Short Method:** Subtract the sum of the three numbers from the sum of four numbers  
New number:  $100 - 60 = 40$

**Q40: The perimeter of a rectangle is 100 meters. If the length is twice the width, what are the dimensions of the rectangle?**

**Long Method:** Let the width be  $w$  and the length be  $2w$ . The perimeter  $P$  is:  $2(l+w) = 100$ :  
Substitute the length:  $2(2w+w) = 100$ :  $2 \times 3w = 100$ :  $2 \times 3w = 100$ :  $6w = 100$ :  $w = 100/6 = 16.67$   
The length is:  $2w = 2 \times 16.67 = 33.332$

**Short Method:** Divide the perimeter parts by total parts (6):  $100/6 = 16.67$ .  
Length is  $2 \times 16.67 = 33.332$ .

**Q41: If  $x-3=2x+5$ , what is the value of  $x$ ?**

**Long Method:** Solve the equation by isolating  $x$ :  $x-3=2x+5$   
Subtract  $x$  from both sides:  $-3=x+5$   
Subtract 5 from both sides:  $-8=x$   
 $x=8$

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**Short Method:** Isolate  $x$  quickly:  $x = -8$ .

**Q42: A car travels 240 km in 4 hours. What is the speed of the car?**

**Long Method:** The speed can be found using the formula: Speed = [Distance/Time]

Speed = [240 km/4 hours]

Speed = 60 km/h

**Short Method:** Divide distance by time:  $240/4 = 60$  km/h

**Q43: If  $y = 3x + 7$  and  $y = 16$  what is the value of  $x$ ?**

**Long Method:** Substitute  $y = 16$  into the equation:  $16 = 3x + 7$ .

Subtract 7 from both sides:  $9 = 3x$ : Divide both sides by 3:  $x = 3$

**Short Method:** Quickly solve for  $x$ :  $3x = 9 \rightarrow x = 3$ .

**Q44: The sum of the digits of a two-digit number is 9. If the tens digit is 4 more than the units digit, what is the number?**

**Long Method:** Let the unit's digit be  $x$  and the tens digit be  $x + 4$ .

According to the problem:  $(x + 4) + x = 9$ :  $2x + 4 = 9$ . Subtract 4 from both sides:  $2x = 5$ ;

Divide by 2:  $x = 2.5$

So the number is  $2.5 + 4 = 6.5$

**Short Method:** Solve the linear equation:  $2x = 5 \rightarrow x = 2.5$   $2x = 5 \rightarrow x = 2.5$

**Q45: If  $3x - 5 = 2x + 7$ , what is the value of  $x$ ?**

**Long Method:** Solve the equation by isolating  $x$ :  $3x - 5 = 2x + 7$ . Subtract  $2x$  from both sides:  $x - 5 = 7$ .

Add 5 to both sides:  $x = 12$

**Short Method:** Isolate  $x$  quickly:  $x = 12$

**Q46: The area of a triangle is 24 square meters and its base is 6 meters. What is the height?**

**Long Method:** The area  $A$  of a triangle is given by:  $A = [1/2] \times \text{base} \times \text{height}$ :

Given  $A = 24$  and base = 6:  $24 = [1/2] \times 6 \times \text{height}$ . Solve for height

Height = 8 meters

**Short Method:** Divide area by half the base:  $24/3 = 8$  meters.

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**Q47: A man saves \$50 each month. How much will he save in 5 years?**

**Long Method:** First, find the number of months in 5 years:  $5 \times 12 = 60$  months:  $5 \times 12 = 60$  months Then, find the total savings:  $50 \times 60 = 3000$  dollars

**Short Method:** Multiply monthly savings by number of months:  $50 \times 60 = 3000$  dollars

**Q48: The average of 5 numbers is 18. If one of the numbers is removed, the average of the remaining numbers is 15. What is the removed number?**

**Long Method:** First, find the total sum of the five numbers:  $5 \times 18 = 90$ :

Then, find the total sum of the remaining four numbers:  $4 \times 15 = 60$ : Subtract to find the removed number:  $90 - 60 = 30$ .

**Short Method:** Subtract the total of remaining numbers from the original total:  $90 - 60 = 30$

**Q49: A cube has a volume of 64 cubic centimeters. What is the length of each side?**

**Long Method:** The volume  $V$  of a cube with side length  $s$  is:  $V = s^3$ :

Given  $V = \sqrt[3]{64} = 4$

**Short Method:** Take the cube root of the volume:  $\sqrt[3]{64} = 4$ cm

**Q50: If the sum of the squares of two numbers is 25 and their product is 12, what are the numbers?**

**Long Method:** Let the numbers be  $x$  and  $y$ . According to the problem:  $x^2 + y^2 = 25$   
 $xy = 12$ .

Use the quadratic identity  $(x+y)^2 = x^2 + y^2 + 2xy$ :  $(x+y)^2 = 25 + 24$ ;  $(x+y)^2 = 49$ :  $x+y = \pm 7$

Solve the quadratic equation  $t^2 - 7t + 12 = 0$  The roots are 4 and 3 (or vice versa).

**Short Method:** Use the sum and product of the roots: Roots are 4 and 3.

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