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Logical Reasoning Tricks and Techniques for

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VERBAL REASONING- MATHEMATICAL OPERATION (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 find John's rank from the bottom, we subtract his rank from the total number of students in the class and add 1. So, $40 - 15 + 1 = 26$. Therefore, John is ranked 26th from the bottom.

Short Method: John's rank from the bottom can be found by subtracting his rank from the total number of students and adding 1. Thus, $40 - 15 + 1 = 26$. Therefore, John is 26th from the bottom.

Q2: If a train travels at a speed of 60 km/h, how far will it travel in 2.5 hours?

Long Method: To find the distance traveled, we multiply the speed of the train by the time it travels. So, $60 \text{ km/h} * 2.5 \text{ hours} = 150 \text{ kilometers}$. Therefore, the train will travel 150 kilometers.

Short Method: The distance traveled by the train can be calculated by multiplying its speed by the time taken. Thus, $60 \text{ km/h} * 2.5 \text{ hours} = 150 \text{ kilometers}$. Hence, the train will travel 150 kilometers.

Q3: If $3x - 4 = 20$, what is the value of x?

Long Method: To find the value of x, we isolate x by adding 4 to both sides of the equation. So, $3x = 24$. Then, divide both sides by 3 to find x. Therefore, $x = 8$.

Short Method: The value of x can be found by isolating x in the equation. Adding 4 to both sides, we get $3x = 24$. Hence, $x = 8$.

Q4: A shopkeeper bought 80 apples at \$0.50 each. If he sold each apple for \$1, what is his profit?

Long Method: First, we find the total cost of buying the apples by multiplying the number of apples by the cost per apple, so $80 * \$0.50 = \40 . Then, we calculate the total revenue from selling the apples by multiplying the number of apples by the selling price per apple, so $80 * \$1 = \80 . Finally, we find the profit by subtracting the total cost from the total revenue, so $\$80 - \$40 = \$40$. Thus, the shopkeeper's profit is \$40.

Short Method: The profit made by the shopkeeper can be calculated by finding the difference between the total revenue and the total cost. Since each apple was sold for double the buying price, the profit is the same as the initial cost. Therefore, the profit is \$40.

Q5: If a rectangle has a length of 12 cm and a width of 8 cm, what is its perimeter?

Long Method: To find the perimeter of a rectangle, we add all four sides together. So, $2 * (\text{length} + \text{width}) = 2 * (12 \text{ cm} + 8 \text{ cm}) = 2 * (20 \text{ cm}) = 40 \text{ cm}$. Therefore, the perimeter of the rectangle is 40 cm.

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Short Method: The perimeter of a rectangle can be calculated by adding twice its length and twice its width. Thus, $2*(12\text{ cm} + 8\text{ cm}) = 40\text{ cm}$. Hence, the perimeter is 40 cm.

Q6: If a car travels at a constant speed of 80 km/h, how long will it take to travel 320 kilometers?

Long Method: To find the time taken, we divide the total distance by the speed of the car. So, $320\text{ kilometers} \div 80\text{ km/h} = 4\text{ hours}$. Therefore, it will take the car 4 hours to travel 320 kilometers.

Short Method: The time taken by the car to travel can be found by dividing the total distance by its constant speed. Hence, $320\text{ kilometers} \div 80\text{ km/h} = 4\text{ hours}$. Thus, it will take 4 hours.

Q7: Solve the equation: $2x + 5 = 17$.

Long Method: To solve for x, first, we subtract 5 from both sides of the equation, giving us $2x = 12$. Then, we divide both sides by 2, resulting in $x = 6$. Therefore, $x = 6$.

Short Method: To find the value of x, subtract 5 from both sides of the equation, giving us $2x = 12$. Then, divide both sides by 2, resulting in $x = 6$. Hence, $x = 6$.

Q8: A company produces 500 units of a product daily. If the production cost per unit is \$10 and the selling price per unit is \$20, what is the daily profit?

Long Method: First, we calculate the total production cost by multiplying the number of units produced by the production cost per unit, so $500\text{ units} * \$10 = \5000 . Then, we calculate the total revenue by multiplying the number of units produced by the selling price per unit, so $500\text{ units} * \$20 = \10000 . Finally, we find the daily profit by subtracting the total production cost from the total revenue, so $\$10000 - \$5000 = \$5000$. Thus, the daily profit is \$5000.

Short Method: The daily profit can be calculated by finding the difference between the total revenue and the total production cost. Since each unit is sold for double the production cost, the profit is the same as the production cost. Therefore, the daily profit is \$5000.

Q9: If a triangle has sides of lengths 5 cm, 6 cm, and 7 cm, what is its perimeter?

Long Method: To find the perimeter of a triangle, we add the lengths of all three sides together. So, $5\text{ cm} + 6\text{ cm} + 7\text{ cm} = 18\text{ cm}$. Therefore, the perimeter of the triangle is 18 cm.

Short Method: The perimeter of a triangle can be found by adding the lengths of its three sides. Thus, $5\text{ cm} + 6\text{ cm} + 7\text{ cm} = 18\text{ cm}$. Hence, the perimeter is 18 cm.

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Q10: If a train travels at a speed of 100 km/h for 3 hours, how far will it travel?

Long Method: To find the distance traveled, we multiply the speed of the train by the time it travels. So, $100 \text{ km/h} * 3 \text{ hours} = 300 \text{ kilometers}$. Therefore, the train will travel 300 kilometers.

Short Method: The distance traveled by the train can be calculated by multiplying its speed by the time taken. Thus, $100 \text{ km/h} * 3 \text{ hours} = 300 \text{ kilometers}$. Hence, the train will travel 300 kilometers.

Q11: Solve the equation: $3x - 7 = 20$.

Long Method: To solve for x, first, we add 7 to both sides of the equation, giving us $3x = 27$. Then, we divide both sides by 3, resulting in $x = 9$. Therefore, $x = 9$.

Short Method: To find the value of x, add 7 to both sides of the equation, giving us $3x = 27$. Then, divide both sides by 3, resulting in $x = 9$. Hence, $x = 9$.

Q12: A shopkeeper bought 120 bananas at \$0.30 each. If he sold each banana for \$0.50, what is his profit?

Long Method: First, we find the total cost of buying the bananas by multiplying the number of bananas by the cost per banana, so $120 * \$0.30 = \36 . Then, we calculate the total revenue from selling the bananas by multiplying the number of bananas by the selling price per banana, so $120 * \$0.50 = \60 . Finally, we find the profit by subtracting the total cost from the total revenue, so $\$60 - \$36 = \$24$. Thus, the shopkeeper's profit is \$24.

Short Method: The profit made by the shopkeeper can be calculated by finding the difference between the total revenue and the total cost. Since each banana was sold for a price higher than the buying price, the profit is the difference between the two. Therefore, the profit is \$24.

Q13: If a square has a side length of 10 cm, what is its perimeter?

Long Method: To find the perimeter of a square, we multiply the length of one side by 4. So, $10 \text{ cm} * 4 = 40 \text{ cm}$. Therefore, the perimeter of the square is 40 cm.

Short Method: The perimeter of a square can be found by multiplying the length of one side by 4. Thus, $10 \text{ cm} * 4 = 40 \text{ cm}$. Hence, the perimeter is 40 cm.

Q14: If a car travels at a constant speed of 90 km/h, how long will it take to travel 270 kilometers?

Long Method: To find the time taken, we divide the total distance by the speed of the car. So, $270 \text{ kilometers} \div 90 \text{ km/h} = 3 \text{ hours}$. Therefore, it will take the car 3 hours to travel 270 kilometers.

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Short Method: The time taken by the car to travel can be found by dividing the total distance by its constant speed. Hence, $270 \text{ kilometers} \div 90 \text{ km/h} = 3 \text{ hours}$. Thus, it will take 3 hours.

Q15: Solve the equation: $4x + 9 = 25$.

Long Method: To solve for x , first, we subtract 9 from both sides of the equation, giving us $4x = 16$. Then, we divide both sides by 4, resulting in $x = 4$. Therefore, $x = 4$.

Short Method: To find the value of x , subtract 9 from both sides of the equation, giving us $4x = 16$. Then, divide both sides by 4, resulting in $x = 4$. Hence, $x = 4$.

Q16: A company produces 600 units of a product daily. If the production cost per unit is \$15 and the selling price per unit is \$25, what is the daily profit?

Long Method: First, we calculate the total production cost by multiplying the number of units produced by the production cost per unit, so $600 \text{ units} * \$15 = \9000 . Then, we calculate the total revenue by multiplying the number of units produced by the selling price per unit, so $600 \text{ units} * \$25 = \15000 . Finally, we find the daily profit by subtracting the total production cost from the total revenue, so $\$15000 - \$9000 = \$6000$. Thus, the daily profit is \$6000.

Short Method: The daily profit can be calculated by finding the difference between the total revenue and the total production cost. Since each unit is sold for a price higher than the production cost, the profit is the difference between the two. Therefore, the daily profit is \$6000.

Q17: If a triangle has sides of lengths 8 cm, 10 cm, and 12 cm, what is its perimeter?

Long Method: To find the perimeter of a triangle, we add the lengths of all three sides together. So, $8 \text{ cm} + 10 \text{ cm} + 12 \text{ cm} = 30 \text{ cm}$. Therefore, the perimeter of the triangle is 30 cm.

Short Method: The perimeter of a triangle can be found by adding the lengths of its three sides. Thus, $8 \text{ cm} + 10 \text{ cm} + 12 \text{ cm} = 30 \text{ cm}$. Hence, the perimeter is 30 cm.

Q18: If a train travels at a speed of 120 km/h for 2 hours, how far will it travel?

Long Method: To find the distance traveled, we multiply the speed of the train by the time it travels. So, $120 \text{ km/h} * 2 \text{ hours} = 240 \text{ kilometers}$. Therefore, the train will travel 240 kilometers.

Short Method: The distance traveled by the train can be calculated by multiplying its speed by the time taken. Thus, $120 \text{ km/h} * 2 \text{ hours} = 240 \text{ kilometers}$. Hence, the train will travel 240 kilometers.

Q19: Solve the equation: $5x - 3 = 22$.

Long Method: To solve for x , first, we add 3 to both sides of the equation, giving us $5x = 25$. Then, we divide both sides by 5, resulting in $x = 5$. Therefore, $x = 5$.

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Short Method: To find the value of x , add 3 to both sides of the equation, giving us $5x = 25$. Then, divide both sides by 5, resulting in $x = 5$. Hence, $x = 5$.

Q20: A shopkeeper bought 150 oranges at \$0.40 each. If he sold each orange for \$0.60, what is his profit?

Long Method: First, we find the total cost of buying the oranges by multiplying the number of oranges by the cost per orange, so $150 * \$0.40 = \60 . Then, we calculate the total revenue from selling the oranges by multiplying the number of oranges by the selling price per orange, so $150 * \$0.60 = \90 . Finally, we find the profit by subtracting the total cost from the total revenue, so $\$90 - \$60 = \$30$. Thus, the shopkeeper's profit is \$30.

Short Method: The profit made by the shopkeeper can be calculated by finding the difference between the total revenue and the total cost. Since each orange was sold for a price higher than the buying price, the profit is the difference between the two. Therefore, the profit is \$30.

Q21: If a square has a side length of 15 cm, what is its perimeter?

Long Method: To find the perimeter of a square, we multiply the length of one side by 4. So, $15 \text{ cm} * 4 = 60 \text{ cm}$. Therefore, the perimeter of the square is 60 cm.

Short Method: The perimeter of a square can be found by multiplying the length of one side by 4. Thus, $15 \text{ cm} * 4 = 60 \text{ cm}$. Hence, the perimeter is 60 cm.

Q22: If a car travels at a constant speed of 110 km/h, how long will it take to travel 330 kilometers?

Long Method: To find the time taken, we divide the total distance by the speed of the car. So, $330 \text{ kilometers} \div 110 \text{ km/h} = 3 \text{ hours}$. Therefore, it will take the car 3 hours to travel 330 kilometers.

Short Method: The time taken by the car to travel can be found by dividing the total distance by its constant speed. Hence, $330 \text{ kilometers} \div 110 \text{ km/h} = 3 \text{ hours}$. Thus, it will take 3 hours.

Q23: Solve the equation: $6x - 2 = 34$.

Long Method: To solve for x , first, we add 2 to both sides of the equation, giving us $6x = 36$. Then, we divide both sides by 6, resulting in $x = 6$. Therefore, $x = 6$.

Short Method: To find the value of x , add 2 to both sides of the equation, giving us $6x = 36$. Then, divide both sides by 6, resulting in $x = 6$. Hence, $x = 6$.

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Q24: A company produces 800 units of a product daily. If the production cost per unit is \$20 and the selling price per unit is \$30, what is the daily profit?

Long Method: First, we calculate the total production cost by multiplying the number of units produced by the production cost per unit, so $800 \text{ units} * \$20 = \16000 . Then, we calculate the total revenue by multiplying the number of units produced by the selling price per unit, so $800 \text{ units} * \$30 = \24000 . Finally, we find the daily profit by subtracting the total production cost from the total revenue, so $\$24000 - \$16000 = \$8000$. Thus, the daily profit is \$8000.

Short Method: The daily profit can be calculated by finding the difference between the total revenue and the total production cost. Since each unit is sold for a price higher than the production cost, the profit is the difference between the two. Therefore, the daily profit is \$8000.

Q25: If a triangle has sides of lengths 9 cm, 12 cm, and 15 cm, what is its perimeter?

Long Method: To find the perimeter of a triangle, we add the lengths of all three sides together. So, $9 \text{ cm} + 12 \text{ cm} + 15 \text{ cm} = 36 \text{ cm}$. Therefore, the perimeter of the triangle is 36 cm.

Short Method: The perimeter of a triangle can be found by adding the lengths of its three sides. Thus, $9 \text{ cm} + 12 \text{ cm} + 15 \text{ cm} = 36 \text{ cm}$. Hence, the perimeter is 36 cm.

Q26: If a train travels at a speed of 130 km/h for 2.5 hours, how far will it travel?

Long Method: To find the distance traveled, we multiply the speed of the train by the time it travels. So, $130 \text{ km/h} * 2.5 \text{ hours} = 325 \text{ kilometers}$. Therefore, the train will travel 325 kilometers.

Short Method: The distance traveled by the train can be calculated by multiplying its speed by the time taken. Thus, $130 \text{ km/h} * 2.5 \text{ hours} = 325 \text{ kilometers}$. Hence, the train will travel 325 kilometers.

Q27: Solve the equation: $7x - 5 = 26$.

Long Method: To solve for x, first, we add 5 to both sides of the equation, giving us $7x = 31$. Then, we divide both sides by 7, resulting in $x = 31/7$. Therefore, $x = 31/7$.

Short Method: To find the value of x, add 5 to both sides of the equation, giving us $7x = 31$. Then, divide both sides by 7, resulting in $x = 31/7$. Hence, $x = 31/7$.

Q28: A shopkeeper bought 200 apples at \$0.50 each. If he sold each apple for \$0.80, what is his profit?

Long Method: First, we find the total cost of buying the apples by multiplying the number of apples by the cost per apple, so $200 * \$0.50 = \100 . Then, we calculate the total revenue from selling the apples by multiplying the number of apples by the selling price per apple, so $200 * \$0.80 = \160 . Finally, we

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find the profit by subtracting the total cost from the total revenue, so $\$160 - \$100 = \$60$. Thus, the shopkeeper's profit is \$60.

Short Method: The profit made by the shopkeeper can be calculated by finding the difference between the total revenue and the total cost. Since each apple was sold for a price higher than the buying price, the profit is the difference between the two. Therefore, the profit is \$60.

Q29: If a square has a side length of 20 cm, what is its perimeter?

Long Method: To find the perimeter of a square, we multiply the length of one side by 4. So, $20 \text{ cm} * 4 = 80 \text{ cm}$. Therefore, the perimeter of the square is 80 cm.

Short Method: The perimeter of a square can be found by multiplying the length of one side by 4. Thus, $20 \text{ cm} * 4 = 80 \text{ cm}$. Hence, the perimeter is 80 cm.

Q30: If a car travels at a constant speed of 150 km/h, how long will it take to travel 450 kilometers?

Long Method: To find the time taken, we divide the total distance by the speed of the car. So, $450 \text{ kilometers} \div 150 \text{ km/h} = 3 \text{ hours}$. Therefore, it will take the car 3 hours to travel 450 kilometers.

Short Method: The time taken by the car to travel can be found by dividing the total distance by its constant speed. Hence, $450 \text{ kilometers} \div 150 \text{ km/h} = 3 \text{ hours}$. Thus, it will take 3 hours.

Q31: Solve the equation: $8x - 3 = 35$.

Long Method: To solve for x, first, we add 3 to both sides of the equation, giving us $8x = 38$. Then, we divide both sides by 8, resulting in $x = 38/8$. Therefore, $x = 4.75$.

Short Method: To find the value of x, add 3 to both sides of the equation, giving us $8x = 38$. Then, divide both sides by 8, resulting in $x = 4.75$. Hence, $x = 4.75$.

Q32: A company produces 1000 units of a product daily. If the production cost per unit is \$25 and the selling price per unit is \$35, what is the daily profit?

Long Method: First, we calculate the total production cost by multiplying the number of units produced by the production cost per unit, so $1000 \text{ units} * \$25 = \25000 . Then, we calculate the total revenue by multiplying the number of units produced by the selling price per unit, so $1000 \text{ units} * \$35 = \35000 . Finally, we find the daily profit by subtracting the total production cost from the total revenue, so $\$35000 - \$25000 = \$10000$. Thus, the daily profit is \$10000.

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Short Method: The daily profit can be calculated by finding the difference between the total revenue and the total production cost. Since each unit is sold for a price higher than the production cost, the profit is the difference between the two. Therefore, the daily profit is \$10000.

Q33: If a triangle has sides of lengths 10 cm, 15 cm, and 20 cm, what is its perimeter?

Long Method: To find the perimeter of a triangle, we add the lengths of all three sides together. So, $10\text{ cm} + 15\text{ cm} + 20\text{ cm} = 45\text{ cm}$. Therefore, the perimeter of the triangle is 45 cm.

Short Method: The perimeter of a triangle can be found by adding the lengths of its three sides. Thus, $10\text{ cm} + 15\text{ cm} + 20\text{ cm} = 45\text{ cm}$. Hence, the perimeter is 45 cm.

Q34: If a train travels at a speed of 160 km/h for 2 hours, how far will it travel?

Long Method: To find the distance traveled, we multiply the speed of the train by the time it travels. So, $160\text{ km/h} * 2\text{ hours} = 320\text{ kilometers}$. Therefore, the train will travel 320 kilometers.

Short Method: The distance traveled by the train can be calculated by multiplying its speed by the time taken. Thus, $160\text{ km/h} * 2\text{ hours} = 320\text{ kilometers}$. Hence, the train will travel 320 kilometers.

Q35: Solve the equation: $9x - 4 = 49$.

Long Method: To solve for x, first, we add 4 to both sides of the equation, giving us $9x = 53$. Then, we divide both sides by 9, resulting in $x = 53/9$. Therefore, $x \approx 5.89$.

Short Method: To find the value of x, add 4 to both sides of the equation, giving us $9x = 53$. Then, divide both sides by 9, resulting in $x = 53/9$. Hence, $x \approx 5.89$.

Q36: A shopkeeper bought 250 bananas at \$0.60 each. If he sold each banana for \$0.90, what is his profit?

Long Method: First, we find the total cost of buying the bananas by multiplying the number of bananas by the cost per banana, so $250 * \$0.60 = \150 . Then, we calculate the total revenue from selling the bananas by multiplying the number of bananas by the selling price per banana, so $250 * \$0.90 = \225 . Finally, we find the profit by subtracting the total cost from the total revenue, so $\$225 - \$150 = \$75$. Thus, the shopkeeper's profit is \$75.

Short Method: The profit made by the shopkeeper can be calculated by finding the difference between the total revenue and the total cost. Since each banana was sold for a price higher than the buying price, the profit is the difference between the two. Therefore, the profit is \$75.

Q37: If a square has a side length of 25 cm, what is its perimeter?

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Long Method: To find the perimeter of a square, we multiply the length of one side by 4. So, $25 \text{ cm} * 4 = 100 \text{ cm}$. Therefore, the perimeter of the square is 100 cm.

Short Method: The perimeter of a square can be found by multiplying the length of one side by 4. Thus, $25 \text{ cm} * 4 = 100 \text{ cm}$. Hence, the perimeter is 100 cm.

Q38: If a car travels at a constant speed of 170 km/h, how long will it take to travel 510 kilometers?

Long Method: To find the time taken, we divide the total distance by the speed of the car. So, $510 \text{ kilometers} \div 170 \text{ km/h} = 3 \text{ hours}$. Therefore, it will take the car 3 hours to travel 510 kilometers.

Short Method: The time taken by the car to travel can be found by dividing the total distance by its constant speed. Hence, $510 \text{ kilometers} \div 170 \text{ km/h} = 3 \text{ hours}$. Thus, it will take 3 hours.

Q39: Solve the equation: $10x - 5 = 55$.

Long Method: To solve for x, first, we add 5 to both sides of the equation, giving us $10x = 60$. Then, we divide both sides by 10, resulting in $x = 60/10$. Therefore, $x = 6$.

Short Method: To find the value of x, add 5 to both sides of the equation, giving us $10x = 60$. Then, divide both sides by 10, resulting in $x = 60/10$. Hence, $x = 6$.

Q40: A company produces 1200 units of a product daily. If the production cost per unit is \$30 and the selling price per unit is \$40, what is the daily profit?

Long Method: First, we calculate the total production cost by multiplying the number of units produced by the production cost per unit, so $1200 \text{ units} * \$30 = \36000 . Then, we calculate the total revenue by multiplying the number of units produced by the selling price per unit, so $1200 \text{ units} * \$40 = \48000 . Finally, we find the daily profit by subtracting the total production cost from the total revenue, so $\$48000 - \$36000 = \$12000$. Thus, the daily profit is \$12000.

Short Method: The daily profit can be calculated by finding the difference between the total revenue and the total production cost. Since each unit is sold for a price higher than the production cost, the profit is the difference between the two. Therefore, the daily profit is \$12000

Q41: If a triangle has sides of lengths 6 cm, 8 cm, and 10 cm, is it a right-angled triangle?

Long Method: To determine if the triangle is right-angled, we can use the Pythagorean theorem. Squaring each side length, we get $6^2=36$, $8^2=64$, and $10^2=100$. Adding the squares of the two smaller sides, $36+64=100$, which equals the square of the largest side. Since the

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sum of the squares of the two smaller sides is equal to the square of the largest side, this triangle is a right-angled triangle.

Short Method: This triangle is a right-angled triangle because it satisfies the condition of the Pythagorean theorem, where the sum of the squares of the two smaller sides equals the square of the largest side.

Q42: If a circle has a radius of 5 cm, what is its circumference?

Long Method: The circumference of a circle can be calculated using the formula $2\pi r$, where r is the radius. Substituting the given radius, we get $2 \times \pi \times 5 = 10\pi$ cm, which is approximately 31.42 cm.

Short Method: The circumference of a circle with radius r is $2\pi r$. Thus, for a circle with a radius of 5 cm, the circumference is 10π cm, approximately 31.42 cm.

Q43: If a rectangle has a length of 18 cm and a width of 12 cm, what is its area?

Long Method: The area of a rectangle can be calculated by multiplying its length by its width. So, $18 \times 12 = 216$ square centimeters.

Short Method: The area of a rectangle with length L and width W is $L \times W$. Thus, for a rectangle with a length of 18 cm and a width of 12 cm, the area is 216 square centimeters.

Q44: If a train travels at a speed of 90 km/h for 4 hours and then at a speed of 120 km/h for 2 hours, what is the total distance traveled?

Long Method: We calculate the distance traveled for each segment of the journey and then add them together. For the first segment, $90 \times 4 = 360$ km. For the second segment, $120 \times 2 = 240$ km. So, the total distance traveled is $360 + 240 = 600$ km.

Short Method: The total distance traveled is the sum of the distances covered at each speed. For the first segment, $90 \times 4 = 360$ km. For the second segment, $120 \times 2 = 240$ km. Thus, the total distance is $360 + 240 = 600$ km.

Q46: A recipe calls for 2 cups of flour to make 12 cookies. How many cups of flour are needed to make 36 cookies?

Long Method: We can set up a proportion to find the amount of flour needed for 36 cookies. If 2 cups of flour are needed for 12 cookies, then x cups of flour are needed for 36 cookies, where $\frac{2}{12} = \frac{x}{36}$. Solving for x , we get $x = \frac{2 \times 36}{12} = 6$ cups of flour.

Short Method: To make 36 cookies, we need 3 times the amount of flour required for 12 cookies. Thus, $2 \times 3 = 6$ cups of flour are needed.

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