WONDERLEARNERZ PRIMARY ACADEMY â€" OFFICIAL ANSWER KEY & MARKING SCHEME

# Mathematical Reasoning and Puzzles - Worksheet 5 [ANSWER KEY]

Grade 4 | Mathematics | Ch 19: Mathematical Reasoning and Puzzles | Total Marks: 19 | Time: 30 Minutes

**Q1. In a 3x3 magic square using digits 1 to 9, what is the sum of any row, column, or diagonal?** [1 Mark]

**Correct Answer: 15**

*Explanation: The magic sum of a standard 1-9 3x3 square is 15.*

**Q2. A function machine rule is: 'Multiply input by 4 and add 3'. What is the output for input 5?** [1 Mark]

**Correct Answer: 23**

*Explanation: (5 x 4) + 3 = 20 + 3 = 23.*

**Q3. If 1 Star + 1 Star + 1 Star = 27, what is the value of 1 Star?** [1 Mark]

**Correct Answer: 9**

*Explanation: 27 / 3 = 9.*

**Q4. If 1 Circle + 1 Square = 20 and 1 Circle = 14, what is the value of 1 Square?** [1 Mark]

**Correct Answer: 6**

*Explanation: 20 - 14 = 6.*

**Q5. At the Treasure Island Vault, a balance scale shows that 2 identical brass weights balance a 50g weight and a 30g weight. What is the weight of one brass weight?** [1 Mark]

**Correct Answer: 40g**

*Explanation: 50g + 30g = 80g. 80g / 2 = 40g each.*

**Q6. A lock combination riddle: 'I am a 3-digit number. My hundreds digit is 3. My tens digit is twice my hundreds digit. My ones digit is 1 less than my tens digit.' What is the code?** [1 Mark]

**Correct Answer: 365**

*Explanation: Hundreds = 3. Tens = 3 x 2 = 6. Ones = 6 - 1 = 5. The number is 365.*

**Q7. An input-output conveyor machine converts: Input 2 -> 8, Input 4 -> 16, Input 6 -> 24. What will the machine output when the input is 9?** [1 Mark]

**Correct Answer: 36**

*Explanation: The rule is 'Multiply by 4'. 9 x 4 = 36.*

**Q8. A magic square row contains the numbers [ 8 ], [ ? ], and [ 6 ]. If the magic sum is 24, what number is missing in the middle?** [1 Mark]

**Correct Answer: 10**

*Explanation: 8 + 6 = 14. 24 - 14 = 10.*

**Q9. Find the missing input: The function rule is 'Subtract 7, then multiply by 2'. The output is 16. What was the input?** [1 Mark]

**Correct Answer: 15**

*Explanation: Work backwards: 16 / 2 = 8. 8 + 7 = 15.*

**Q10. Oliver claims that 7, 7, 7 can never form a row in a magic square with sum 21 because magic squares must always have 3 different numbers. Is Oliver correct?** [1 Mark]

**Correct Answer: Yes, standard magic squares require all numbers in the grid to be distinct (unique)**

*Explanation: In a standard mathematical magic square, all entries must be distinct unique numbers.*

**Q11. Maya solves an input-output puzzle where Input 2 -> 5 and Input 3 -> 6. She** [1 Mark]
announces the rule is '+ 3'. Then Input 4 gives 7, but for Input 5 the table shows 10. What did Maya overlook?
**Correct Answer: The inputs might not be consecutive, or the rule might not apply to non-consecutive jumps without checking the input step size**
*Explanation: Always check that the rule works consistently for every single row in the table.*

**Q12. Why must the center number of a 3x3 magic square with digits 1 to 9 always be 5?** [2 Marks]
**Correct Answer: The center cell belongs to 4 lines (1 row, 1 column, 2 diagonals) and 5 is the exact median/average of numbers 1 to 9**
*Explanation: The center cell participates in 4 equations, requiring the exact arithmetic mean of 1 to 9, which is 5.*

**Q13. If Scale 1 shows: 1 Triangle = 2 Squares, and Scale 2 shows: 1 Square = 3** [2 Marks]
Circles, how many Circles will balance 1 Triangle?
**Correct Answer: 6 Circles**
*Explanation: 1 Triangle = 2 Squares = 2 x (3 Circles) = 6 Circles.*

**Q14. I am thinking of a 2-digit number. It is an odd multiple of 7. The sum of its** [2 Marks]
digits is 10. What is my number?
**Correct Answer: 91**
*Explanation: Multiples of 7: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91 (9 + 1 = 10, odd). The number is 91.*

**Q15. In a farmyard puzzle, there are 10 heads and 28 legs among chickens (2 legs) and** [2 Marks]
cows (4 legs). How many cows are there in the farmyard?
**Correct Answer: 4 cows**
*Explanation: If all 10 were chickens, there would be 20 legs. 28 - 20 = 8 extra legs. Each cow adds 2 extra legs: 8 / 2 = 4 cows (and 6 chickens).*