Place Value, Rounding & Written Calculations

Topic: Number, Place Value, Column Addition & Subtraction | Time Allowed: 45 Minutes | Total Marks: 35

Candidate Name: _____ **Date:** _____ **Score:** _____

1. CORE MATHEMATICAL CONCEPTS & RULES

- Place value is the value of each digit based on its position in a number (Thousands, Hundreds, Tens, Ones).
- In a 4-digit number like 7,452: 7 has a value of 7,000, 4 is 400, 5 is 50, and 2 is 2.
- Rounding Rules: Look at the digit to the right of the target place. If it is 5 or more, round up; if 4 or less, round down.
- Roman Numerals: I = 1, V = 5, X = 10, L = 50, C = 100, D = 500, M = 1,000. (e.g. XL = 40, XC = 90).

2. STEP-BY-STEP EXAMINER WORKED EXAMPLE: MULTI-STEP COLUMN SUBTRACTION WITH EXCHANG

Problem: Calculate 6,024 - 2,758 using column subtraction.

Method & Steps:

1. Align digits in columns by place value (Th, H, T, O).
2. Ones column (4 - 8): Cannot do without negative, exchange 1 ten from 2 tens -> 1 ten remains, 4 ones becomes 14 ones. 14 - 8 = 6.
3. Tens column (1 - 5): Cannot do, exchange from hundreds (0), so exchange from 6 thousands -> 5 thousands, 10 hundreds. Now exchange 1 hundred -> 9 hundreds, 11 tens. 11 - 5 = 6.
4. Hundreds column: 9 - 7 = 2.
5. Thousands column: 5 - 2 = 3.

Final Solution: 3,266

3. 11+ EXAM TECHNIQUE & SPEED CALCULATION STRATEGIES

1. Always show full written working: examiners award partial method marks even if arithmetic slips occur.
2. Estimate your answer before calculating to check if your final magnitude makes realistic sense.
3. Watch units carefully (e.g. converting cm to m, millilitres to litres, hours to minutes).
4. In timed exam conditions, spend ~1 minute per mark and flag difficult problems for the end.
5. Specialist 1-to-1 Maths & Science tuition available: www.themathsandsciencetutor.co.uk

Section A: Practice Exercises & Exam Questions

Show all calculations clearly. Write your final answer in the box. Total: 20 Marks

[FLUENCY] **Question 1: Digit Value** **[2 marks]**

In the number 6,482, what is the value of the digit 4? Write the value in words and digits.

Answer / Working:

[FLUENCY] **Question 2: Rounding** **[3 marks]**

Round 4,785 to the nearest 10, to the nearest 100, and to the nearest 1,000.

Answer / Working:

[FLUENCY] **Question 3: Roman Numerals** **[2 marks]**

Convert the Roman numeral LXXIV into standard Hindu-Arabic digits.

Answer / Working:

[REASONING] **Question 4: Missing Digit** **[2 marks]**

In the sum 3,[]45 + 1,283 = 4,928, find the missing digit inside the box []. Explain your method.

Answer / Working:

[WORD PROB] **Question 5: School Supplies** **[3 marks]**

A primary school ordered 2,450 exercise books. In the first term, 1,675 books were used. During the second term, a delivery of 850 new books arrived. How many exercise books does the school have now?

Answer / Working:

[REASONING] **Question 6: Number Properties** **[3 marks]**

I am a 4-digit even number. My thousands digit is double my ones digit. My hundreds digit is 0. My tens digit is the sum of my thousands and ones. If my ones digit is 3, what number am I?

Answer / Working:

Section B: 11+ Grammar & Independent School Challenges

Advanced multi-step reasoning problems from top UK selective entrance exams.

CHALLENGE 1: THE PALINDROMIC TICKET MYSTERY [3 MARKS]

A four-digit bus ticket number is palindromic (reads the same forwards and backwards). The sum of its digits is 18.
The difference between the first and second digit is 3. Find all possible four-digit ticket numbers.

Final Answer:

CHALLENGE 2: DIGIT CARD LOGIC PUZZLE [3 MARKS]

Using each of the digit cards 2, 4, 7, and 9 exactly once, create a calculation: [ ][ ] x [ ][ ] that produces the greatest possible product.
Show your trial working and explain why your arrangement gives the maximum total.

Final Answer:

ROUGH WORKING / TRIAL & IMPROVEMENT SPACE

Section C: Examiner Mark Scheme & Method Solutions

Step-by-step methods, mark allocations, and alternative approaches.

Question 1 [Fluency] **Answer: 400 (Four hundred)**

Method: The digit 4 is in the hundreds position, so its value is 4 x 100 = 400.

Question 2 [Fluency] **Answer: Nearest 10: 4,790 | Nearest 100: 4,800 | Nearest 1,000: 5,000**

Method: Units digit 5 rounds 80 to 90; tens digit 8 rounds 700 to 800; hundreds digit 7 rounds 4,000 to 5,000.

Question 3 [Fluency] **Answer: 74**

Method: L (50) + XX (20) + IV (4) = 50 + 20 + 4 = 74.

Question 4 [Reasoning] **Answer: 6 (Missing digit is 6)**

Method: 4,928 - 1,283 = 3,645. Therefore the hundreds digit in the first number is 6.

Question 5 [Word Prob] **Answer: 1,625 exercise books**

Method: 2,450 - 1,675 = 775 books remaining. Then 775 + 850 = 1,625 books in total.

Question 6 [Reasoning] **Answer: 6,093 is impossible for an even number -> Correct Even interpretation: Ones=2: 4,062**

Method: If ones=3, the number would be odd. For the even condition: ones=2 -> thousands=4, tens=6, hundreds=0 -> 4,062.

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