FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

N3: Inverse operations and priority

Solve problems using inverse operations, priority of operations, powers and roots

20 marks · 25 minutes · Non-calculator

1) Amy thinks of a number. She multiplies it by 3, subtracts 5, divides by 2 and then squares the result. Her answer is 64. Her intermediate results were all positive. What number did she think of?

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[Question 1: 3 marks]

2) $35 \times 48 = 1680$. Use this to work out $3.5 \times 4.8 + 1680 \div 0.48$

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[Question 2: 3 marks]

3) Use each of the numbers 2, 3 and 4 once to fill the boxes in $\square^{\square} + \square$. Find the largest possible value.

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[Question 3: 3 marks]

4) A positive number plus its reciprocal equals 2.5. Find the two possible values of the number.

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[Question 4: 3 marks]

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5) Use each of the numbers 1, 5, 5 and 5 exactly once, with any of +, −, ×, ÷ and brackets, to make 24

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[Question 5: 3 marks]

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6) A square garden has an area of 60 m^2. Fencing costs £12 per metre. Without a calculator, estimate the cost of fencing all four sides.

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[Question 6: 3 marks]

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7) By how much is $(a + b)^2$ greater than $a^2 + b^2$ when $a = 3$ and $b = 4$?

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[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	7	Reverse: $\sqrt{64} = 8$ (P1); $8 \times 2 + 5 = 21$ (P1); $21 \div 3 = 7$ (A1).
2	3516.8	$3.5 \times 4.8 = 16.8$ (P1); $1680 \div 0.48 = 3500$ (P1); A1.
3	83	Tries at least three arrangements (P1); compares, e.g. $4^3 + 2 = 66$, $3^4 + 2 = 83$ (P1); 83 (A1).
4	2 and $\frac{1}{2}$	Tries values or forms $x + \frac{1}{x} = 2.5$ (P1); finds 2 (A1); finds $\frac{1}{2}$ (A1).
5	$5 \times \left(5 - \frac{1}{5}\right)$	Uses a fraction such as $\frac{1}{5}$ (P1); 5×4.8 (P1); correct expression (A1).
6	About £370	$\sqrt{60} \approx 7.7$ (P1); perimeter about 31 m (P1); £360 to £380 (A1).
7	24	49 and 25 (P1); A1.