FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

N14: Estimation

Use estimation to check calculations and judge over- and under-estimates

20 marks · 25 minutes · Non-calculator

1) Show that 4.9×61.2 is about 300

[Question 1: 2 marks]

2) Lee says $39.6 \times 0.52 = 205.92$. Use estimation to show that he is wrong.

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[Question 2: 2 marks]

3) Estimate $297 \div 5.2$. Is your estimate bigger or smaller than the exact answer? Explain.

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[Question 3: 3 marks]

4) Mia buys 9 items at £4.95 each. She has £50. Use estimation to show that she has enough money.

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[Question 4: 2 marks]

5) Show that $\sqrt{48.5} \times 9.8$ is about 70

[Question 5: 2 marks]

6) Using $\pi \approx 3$, estimate the area of a circle with radius 6.1 cm. Is the exact area bigger or smaller than your estimate? Explain.

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[Question 6: 3 marks]

7) Show that 0.21×0.48 is about 0.1

[Question 7: 2 marks]

8) Explain why rounding to 1 significant figure is useful for estimating.

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[Question 8: 1 marks]

9) A car uses 6.8 litres of fuel per 100 km. Estimate the fuel used for 412 km. Is your estimate an overestimate or an underestimate? Explain.

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[Question 9: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Shown	5×60 (M1); 300 (C1).
2	About 20	$40 \times 0.5 = 20$ (M1); 205.92 is about ten times too big (C1).
3	60, overestimate	$300 \div 5$ (M1); 60 (A1); numerator rounded up and divisor rounded down (C1).
4	Shown	$9 \times 5 = 45$ (M1); 45 ¡ 50 and exact cost is even less (C1).
5	Shown	7×10 (M1); 70 (C1).
6	108, bigger	3×36 (M1); 108 (A1); $\pi > 3$ and $6.1 > 6$ (C1).
7	Shown	0.2×0.5 (M1); 0.1 (C1).
8	Explanation	Makes mental calculation easy (C1).
9	28, overestimate	7×4 (M1); 28 (A1); both values rounded up (C1).