

Answer Key — Doubling & Halving Strategies

Year 4 Mathematics · Number and algebra · WA4MNAMU1

Section A — Fluency (16 marks, 1 mark each)

1. 68
2. 114
3. 60
4. 92
5. 96
6. 72
7. 43
8. 72
9. 90
10. 130
11. 76
12. 56
13. 125
14. 160
15. 84
16. 112

Section B — Core (21 marks)

1. Double \$24 = \$48. [2 marks working, 1 mark correct answer]
2. (a) $16 \times 4 = 64$ muffins (double, then double again). (b) $64 \times \$2 = \$128$. [2 marks part (a), 2 marks part (b)]
3. $7 \times 4 = 28\text{km}$ (double, then double again). [2 marks working, 1 mark correct answer]
4. (a) Half of 2,400 = 1,200 seats. (b) $2,400 + 1,200 = 3,600$ seats in total. [2 marks part (a), 2 marks part (b)]
5. Half of \$46 = \$23. [2 marks working, 1 mark correct answer]
6. (a) Double \$180 = \$360 (within the sponsor's \$400 maximum). (b) $\$180 + \$360 = \$540$ total raised. [2 marks part (a), 2 marks part (b)]

Section C — Reasoning (9 marks) — sample responses, award marks for valid reasoning

1. Doubling a number means multiplying it by 2; doubling it again multiplies it by 2 a second time, and $2 \times 2 = 4$, so doubling twice is the same as multiplying by 4. [2 marks]
2. Yes, the student is correct. Halving means dividing by 2, so halving twice divides by 2 twice, which is the same as dividing by $2 \times 2 = 4$. [2 marks]
3. Double 17 to get 34, double again to get 68, then double a third time to get 136, since doubling three times multiplies by $2 \times 2 \times 2 = 8$. [2 marks]
4. They give the same result, but halving is a quick mental strategy that often works faster in your head, especially for even 'friendly' numbers, while written division by 2 can be slower — so it's still worth knowing both the idea and the quick mental technique. [3 marks]

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Section D — Challenge (7 marks)

1. $96 \div 2 \div 2 \div 2 = 12$, so the original number was 12. [2 marks]
2. $15 \times 2 \times 2 = 60$, so the original number was 60. [2 marks]
3. Double, double, then halve is the same as multiplying by 4 and then dividing by 2, which is an overall multiply by 2; so the original number $\times 2 = 56$, giving 28. [2 marks correct method, 1 mark correct answer]