

Two-Step Problems and Patterns: practice solutions, Grade 3 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Parentheses matter



a) Multiply first: $3 \times 4 = 12$, then $5 + 12 = 17$.

b) Parentheses first: $5 + 3 = 8$, then $8 \times 4 = 32$.

The two answers are different (17 and 32) because the parentheses change the order of the steps.

2 Stickers



Step one: $3 \times 6 = 18$. Step two: $18 + 4 = 22$.

Mia has 22 stickers.

3 Find the unknown



a) Undo the addition: $n = 45 - 18 = 27$. Check: $27 + 18 = 45$.

b) Undo the multiplication: $m = 56 \div 7 = 8$. Check: $7 \times 8 = 56$.

4 Even or odd?



Look at the last digit. Even (last digit 0, 2, 4, 6 or 8): 14, 60, 148. Odd (last digit 1, 3, 5, 7 or 9): 27, 83, 105.

5 Addition table row



- a) 9, 10, 11, 12.
- b) Each time you move one cell to the right, the sum goes up by 1.
- c) $8 + 5 = 12 + 1 = 13$.

6 Multiples of 5



5, 10, 15, 20, 25, 30, 35, 40.

Multiples of 5 end in 0 or 5. 65 ends in 5, so it can be a multiple of 5 ($5 \times 13 = 65$). 72 ends in 2, so it is not.

7 Quick estimate



58 rounds to 60 and 34 rounds to 30, so the estimate is $60 + 30 = 90$.

Exact sum: $58 + 34 = 92$. It is close to 90, so it is reasonable.

8 Muffin trays



Step one: $6 \times 8 = 48$ muffins. Step two: $48 - 19 = 29$.

There are 29 muffins left.

9 Notebooks and a pen



- a) $t = 4 \times 3 + 2$.
- b) $4 \times 3 = 12$, then $12 + 2 = 14$. So $t = 14$ dollars.
- c) $20 - 14 = 6$. Leo gets 6 dollars in change.

10 Two unknowns



- a) $n = 42 \div 6 = 7$. Check: $7 \times 6 = 42$.
- b) Undo the subtraction by adding: $n = 29 + 15 = 44$. Check: $44 - 15 = 29$.

11 Order of operations



- a) $36 \div 6 = 6$ and $4 \times 2 = 8$, so $6 + 8 = 14$.
- b) $2 \times 7 = 14$, so $20 - 14 = 6$.
- c) Parentheses first: $2 + 4 = 6$, then $36 \div 6 = 6$.
- d) $20 - 2 = 18$, then $18 \times 7 = 126$.

12 Is it reasonable?



Round: $50 + 40 = 90$. Sam's answer 77 is much smaller than 90, so it is not reasonable.

Correct sum: $49 + 38 = 87$, which is close to 90.

13 Facts from facts



- a) The table is symmetric, so $7 \times 6 = 42$.
- b) 6×8 is one more group of 6: $42 + 6 = 48$.
- c) $6 \times 5 = 30$ and $6 \times 2 = 12$, and $30 + 12 = 42$.

14 Even or odd sums



- a) even + even = even. $24 + 36 = 60$, even.
- b) odd + odd = even. $17 + 25 = 42$, even.
- c) even + odd = odd. $18 + 31 = 49$, odd.
- d) $9 + 9 = 18$ is even, and even + odd (9) is odd. $9 + 9 + 9 = 27$, odd.

15 Reading marathon



- a) $p = 8 \times 5 + 13$. $8 \times 5 = 40$ and $40 + 13 = 53$. So $p = 53$ pages.
- b) $90 - 53 = 37$. Ava still has 37 pages to read.

16 Two-step equations



- a) Undo the addition: $3 \times n = 29 - 5 = 24$. Undo the multiplication: $n = 24 \div 3 = 8$.
Check: $3 \times 8 + 5 = 29$.
- b) $4 \times n$ must be what is taken away from 50 to get 26: $4 \times n = 50 - 26 = 24$, so
 $n = 24 \div 4 = 6$. Check: $50 - 4 \times 6 = 50 - 24 = 26$.

17 Pencil boxes



- a) Round 28 to 30: $4 \times 30 = 120$. The estimate is about 120, so 212 is far too big and is not reasonable.
- b) $4 \times 20 = 80$ and $4 \times 8 = 32$, so $80 + 32 = 112$. There are 112 pencils, close to the estimate 120.

18 Addition table hunt



a) $1 + 6, 2 + 5, 3 + 4, 4 + 3, 5 + 2, 6 + 1$: 6 cells.

b) Only $6 + 6$: 1 cell.

c) $5 + 6$ and $6 + 5$: 2 cells.

d) $1 + 5, 2 + 4, 3 + 3, 4 + 2, 5 + 1$: 5 cells.

Each sum fills one diagonal. The middle diagonal (sum 7) is the longest, and the diagonals get shorter toward the corners.

19 Nines trick



a) 9×6 : tens digit 5, ones digit $9 - 5 = 4$, so 54. 9×7 : tens digit 6, ones digit 3, so 63.

b) Pattern: tens digit 7, ones digit 2, so 72. Other method:

$9 \times 8 = 10 \times 8 - 8 = 80 - 8 = 72$. Both agree.

c) $2 \times 7 = 14$, and 4×7 is double that: $14 + 14 = 28$.

20 Even and odd reasoning



a) $3 \times 7 = 21$ odd. $4 \times 9 = 36$ even. $5 \times 6 = 30$ even. $7 \times 7 = 49$ odd. A product is even as soon as one factor is even.

b) False. $11 + 13 = 24$ is even, and $24 + 15 = 39$ is odd. One example is enough to show the statement is false.

c) No, 25 is odd. There are 12 pairs and 1 student left over.

21 Family tickets



a) $T = 3 \times 5 + 2 \times 8$.

b) $3 \times 5 = 15$ and $2 \times 8 = 16$, so $T = 15 + 16 = 31$ dollars.

c) They pay 40 dollars: $40 - 31 = 9$. They get 9 dollars in change.



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