Number Tricks

EX12-V1 · storyboard · EX12 Turn instructions into an expression. Read each picture with its sentences.

Picture 1

Think of a number. Add 4, double it, take away 8, then halve it.

$$n + 4 \quad \text{add } 4$$

$$2(n + 4) \quad \text{double it: brackets!}$$

$$2(n + 4) - 8 \quad \text{take away } 8$$

$$\frac{2(n + 4) - 8}{2} \quad \text{halve it}$$

1. Think of a number.
2. Add four, double it, take away eight, then halve it.
3. Call the number n.
4. Add four: n + 4.
5. Double it.
6. The doubling acts on everything so far, so it needs brackets.
7. Take away eight.
8. Halve it: the halving acts on the whole thing.

Picture 2

Simplify $\dfrac{2(n+4)-8}{2}$.

$$\frac{2n+8-8}{2}$$ expand

$$= \frac{2n}{2}$$

$$= \boxed{n}$$ your number back

9. Now simplify it.
10. Expand the bracket: two n plus eight, minus eight.
11. The eights cancel, leaving two n over two.
12. That is n: you always get your number back, whatever it was.

Picture 3

Trap add 4, then double

$\times \; n + 4 \cdot 2$

$\checkmark \; 2(n + 4)$

13. Watch for the trap: leaving out the brackets.
14. n + 4 · 2 doubles only the four.
15. It is two times the bracket n + 4.

Picture 4

Trap $\dfrac{2x + 48}{4}$

✗ $2x + 12$

✓ $\dfrac{x}{2} + 12$

16. And divide every term.
17. Two x plus forty-eight, all over four, is not 2x + 12.
18. Divide the two x too: x over two, plus twelve.