Equivalent linear expressions

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Show that $2(x + 5)$ and $2x + 10$ are equivalent. [2 marks]

Distribute 2 to get $2x + 10$.

Answer: Equivalent.

2. Show that $5x + 3x - 4$ and $8x - 4$ are equivalent. [2 marks]

Collect $5x + 3x = 8x$.

Answer: Equivalent.

3. Is $3(x - 2)$ equivalent to $3x - 2$? Give a counterexample. [2 marks]

Evaluate both at the same permitted input.

Answer: No; at $x = 0$ the outputs are -6 and -2.

4. Simplify $6(x + 1) - 2x$ and compare with $4x + 6$. [2 marks]

Expand to $6x + 6 - 2x$.

Collect to get $4x + 6$.

Answer: They are equivalent.

5. Why is checking $2x + 1$ and $3x$ only at $x = 1$ not enough? [3 marks]

Equivalence means all allowed inputs, not just one.

Answer: They match there but differ at $x = 2$, where the values are 5 and 6.

6. Give an expanded expression and a factorised expression equivalent to $12x + 8$. [3 marks]

Split or collect like terms without changing the value.

Extract common factor 4.

Answer: For example, $8x + 4x + 8$ and $4(3x + 2)$.