Checking solutions and domains

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. State the real domain of $f(x) = 1/(x + 6)$. [2 marks]

The denominator is zero only at $x = -6$.

Answer: All real x except -6.

2. State the real domain of $g(x) = \sqrt{3 - x}$. [2 marks]

Require $3 - x \geq 0$.

Answer: $x \leq 3$

3. State the real domain of $h(x) = \sqrt{x}/(x - 9)$. [2 marks]

The root requires nonnegative x and the denominator excludes 9.

Answer: $x \geq 0$, $x \neq 9$.

4. Check whether $x = 4$ solves $3/(x - 1) = 1$. [2 marks]

The input is allowed and $3/(4 - 1) = 1$.

Answer: Yes.

5. A bus hire cost is $C = 180/n$ dollars per passenger, with at most 30 passengers. State a sensible domain. [3 marks]

The head count is a positive whole number and cannot exceed the capacity.

Answer: $n \in \{1, 2, \ldots, 30\}$.

6. A calculation for $1/(x - 2) = 1$ gives $x = 3$. Another student says $x = 2$ is also possible because multiplying by $x - 2$ removes the denominator. Decide both claims. [3 marks]

$1/(3 - 2) = 1$.

At $x = 2$ the original left side divides by zero.

Answer: $x = 3$ is valid; $x = 2$ is excluded.