# Checking solutions and domains

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

**1.** State the real domain of $f(x)=\frac{1}{x+6}$. [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 $h(x)=\frac{\sqrt{x}}{x-9}$. [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 $\frac{3}{x-1}=1$. [2 marks]

The input is allowed and $\frac{3}{4-1}=1$.

**Answer:** Yes.

**5.** A bus hire cost is $C=\frac{180}{n}$ 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 $\frac{1}{x-2}=1$ gives $x=3$. Another student says $x=2$ is also possible because multiplying by $x-2$ removes the denominator. Decide both claims. [3 marks]

$\frac{1}{3-2}=1$.

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

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