Inverse-proportion graphs and asymptotes

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. y is inversely proportional to x, with $y=6$ at $x=4$. Find its rule. [2 marks]

The constant product is $4\times6=24$.

Answer: $y=\frac{24}{x}$

2. For $y=\frac{-18}{x}$, find y at $x=3$ and $x=-6$. [2 marks]

Substitute each non-zero input separately.

Answer: -6 and 3.

3. Determine whether $(2,12)$, $(3,8)$, $(6,4)$ fit one inverse-proportion rule. [2 marks]

Every pair has product 24.

Answer: Yes: $y=\frac{24}{x}$.

4. For $y=\frac{5}{x+2}-3$, state its vertical and horizontal asymptotes. [2 marks]

The denominator vanishes at -2. As the reciprocal term approaches zero, y approaches -3.

Answer: $x=-2$ and $y=-3$.

5. A rectangular garden has fixed area 48 m². Express width w in terms of length l, and find w when $l=12$ m. [2 marks]

Use $lw=48$, then divide by positive l.

$\frac{48}{12}=4$.

Answer: $w=\frac{48}{l}$, with $l>0$; $w=4$ m.

6. Explain why $y=12-2x$ is not inverse proportion, even while it is positive and decreasing. [2 marks]

At $x=1$, $y=10$ and $xy=10$; at $x=2$, $y=8$ and $xy=16$.

Answer: Its product xy is not constant.