Zero-product principle and integer-root equations

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Solve $(x-4)(x+6)=0$. [2 marks]

$x-4=0$ or $x+6=0$.

Answer: $x=4,\ -6$

2. Solve $x^2+7x+12=0$. [2 marks]

$(x+3)(x+4)=0$.

Answer: $x=-3,\ -4$

3. Solve $x^2-2x-15=0$. [2 marks]

$(x-5)(x+3)=0$.

Answer: $x=5,\ -3$

4. Solve $x^2=9x$. [2 marks]

$x^2-9x=x(x-9)=0$.

Answer: $x=0, 9$

5. Solve $x^2+x=20$. [3 marks]

$x^2+x-20=(x+5)(x-4)=0$.

Answer: $x=4,\ -5$

6. A student divides $x^2=5x$ by x and gives only $x=5$. Find the missing solution and explain. [3 marks]

$x(x-5)=0$ gives $x=0$ or 5.

Division by x wrongly excludes $x=0$.

Answer: $x=0$ is also a solution.