Sum and product of roots

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Find root sum/product for $x^2 - 8x + 10 = 0$. [2 marks]

Apply $\frac{-b}{a}$ and $\frac{c}{a}$.

Answer: Sum 8; product 10.

2. Find root sum/product for $4x^2 + 3x - 2 = 0$. [2 marks]

Divide by leading coefficient 4.

Answer: Sum $\frac{-3}{4}$; product $\frac{-1}{2}$.

3. Form a monic equation with root sum -3 and product 2. [2 marks]

Substitute into $x^2 - Sx + P = 0$.

Answer: $x^2 + 3x + 2 = 0$

4. One root of $x^2 - 7x + 12 = 0$ is 3. Find the other without full factorisation. [2 marks]

The sum is 7, so the other is 4.

Product $3(4) = 12$ checks it.

Answer: 4

5. Roots of $x^2 - 4x + 1 = 0$ are r, s. Form an equation with roots $2r, 2s$. [3 marks]

New sum is 8 and new product is 4.

Use the monic form.

Answer: $x^2 - 8x + 4 = 0$

6. One positive root of $x^2 - kx + 15 = 0$ is three times the other. Find k. [3 marks]

Let roots $t, 3t$, giving $3t^2 = 15$.

Both are positive, so $t = \sqrt{5}$. Add roots to find k.

Answer: $k = 4\sqrt{5}$