Connecting fractional powers with roots

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Write $\sqrt{x}$ as a power, where $x \geq 0$. [2 marks]

A square root has index 1/2.

Answer: $x^{1/2}$

2. Write $a^{4/3}$ in root notation for $a > 0$. [2 marks]

Take the cube root, then raise it to the fourth power.

Answer: $(\sqrt[3]{a})^4$

3. Evaluate $125^{2/3}$. [2 marks]

$\sqrt[3]{125} = 5$, then $5^2 = 25$.

Answer: 25

4. Evaluate $16^{-3/4}$. [2 marks]

$16^{1/4} = 2$, $2^3 = 8$, and the negative power gives 1/8.

Answer: 1/8

5. Evaluate $\sqrt[3]{-216}$. [2 marks]

$(-6)^3 = -216$.

Answer: -6

6. Explain why $(-9)^{1/2}$ is not a real number. [3 marks]

If u is real then $u^2 \geq 0$, so no real u has $u^2 = -9$.

Answer: No real square is negative.