Integer and fractional index laws

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Evaluate 2^{-3}. [2 marks]

$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$.

Answer: $\frac{1}{8}$

2. Evaluate $32^{\frac{2}{5}}$. [2 marks]

$\sqrt[5]{32} = 2$, then $2^2 = 4$.

Answer: 4

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

$\sqrt[4]{16} = 2$; cube to get 8 and invert.

Answer: $\frac{1}{8}$

4. Simplify $\frac{a^4 a^3}{a^2}$ for $a \neq 0$. [2 marks]

The exponent is $4 + 3 - 2 = 5$.

Answer: a^5

5. Simplify $(16x^4)^{\frac{3}{4}}$ for $x > 0$. [3 marks]

$16^{\frac{3}{4}} = 8$; $4(\frac{3}{4}) = 3$.

Answer: $8x^3$

6. Check the claim $(9 + 16)^{\frac{1}{2}} = 9^{\frac{1}{2}} + 16^{\frac{1}{2}}$ and explain the error. [3 marks]

$\sqrt{25} = 5$ while $\sqrt{9} + \sqrt{16} = 3 + 4 = 7$.

A product power law does not apply to addition.

Answer: False: the sides are 5 and 7.