Exponential tables and graphs

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Find y when $x = -1$ in $y = 4^x$. [2 marks]

$4^{-1} = 1/4$.

Answer: 1/4

2. Find the y-intercept of $y = 3 \times 2^x$. [2 marks]

Set $x = 0$: $y = 3$.

Answer: $(0, 3)$

3. State whether $y = 0.7^x$ increases or decreases as x increases. [2 marks]

Each step multiplies by 0.7, a factor below 1.

Answer: Decreases

4. For $y = 2^x$, calculate the outputs at $x = 1/2$ and $x = 3/2$ exactly. [3 marks]

$2^{1/2} = \sqrt{2}$ and $2^{3/2} = 2\sqrt{2}$.

Answer: $\sqrt{2}$ and $2\sqrt{2}$

5. State the domain and range of $y = 5^x$. [2 marks]

A positive-base exponential is defined for all real inputs and always positive.

Answer: Domain: all real x; range: $y > 0$.

6. A culture starts with 4 units and doubles each hour. Write its model and find its size after 3 hours. [3 marks]

The initial multiplier is 4 and the hourly factor is 2. At $t = 3$, $N = 32$.

Answer: $N = 4 \times 2^t$; 32 units.