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]

$4^{-1}=\frac{1}{4}$.

Answer: $\frac{1}{4}$

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 $x=\frac{1}{2}$ and $x=\frac{3}{2}$ exactly. [3 marks]

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

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.