

1. Solve $2^x=32$.

2. Find $\log_2(1/8)$.

3. Solve $3^x=27$.

4. Find the power exponent for the given power data.

5. Find Q at t=4 hours.

6. For positive x and y, $\ln(x+y)=\ln x+\ln y$.

☐ True ☐ False

7. 1^x is constant (always 1), so it is not one-to-one and has no inverse.

☐ True ☐ False

8. Every polynomial root obtained after combining logarithms satisfies the original log equation.

☐ True ☐ False

9. Plotting $\ln y$ against x linearises every power model $y=ax^p$.

☐ True ☐ False

10. A constant exponential proportional rate means the same absolute amount is lost in each equal time interval.

☐ True ☐ False

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1. **5.0**

$32=2^5$, so $x=5$.

2. **-3.0**

$2^{-3}=1/8$, so the logarithm is -3 .

3. **3.0**

$27=3^3$, so $x=3$.

4. **2.0**

The log-log gradient is $\ln 16/\ln 4=2$.

5. **40.0**

$80e^{-\ln 2}=40$.

6. **False**

The log of a sum has no simple law; the product rule is $\ln(xy)=\ln x+\ln y$.

7. **True**

True. 1^x is constant (always 1), so it is not one-to-one and has no inverse.

8. **False**

Logarithms need positive arguments, so check each root in the original equation.

9. **False**

A power model is linear in $\ln y$ against $\ln x$; $\ln y$ against x linearises exponential models.

10. **False**

A constant proportional rate loses the same percentage each interval, so the absolute amount lost falls.