

1. Find the integral of $3x^2$ from 0 to 2.

2. Evaluate the integral of xe^x from 0 to 1.

3. For $y=2e^{(0.5x)}$, find $y(0)$.

4. Find $A(2)$ for the worked accumulation function.

5. Find L_2 for x^2 on $[0,1]$.

6. Integrating $\cos(kx)$ always gives $k \sin(kx)$, including $k=0$.

☐ True ☐ False

7. A definite integral always equals the total positive area, even when the graph crosses the axis.

☐ True ☐ False

8. The integral of a product equals the product of its separate integrals.

☐ True ☐ False

9. An initial condition never changes the constant in a differential-equation solution.

☐ True ☐ False

10. The derivative of an accumulation function is always its accumulated total.

☐ True ☐ False

1. **8.0**

An antiderivative is x^3 . Subtract its values: $2^3-0^3=8$.

2. **1.0**

An antiderivative is $(x-1)e^x$. At 1 and 0 it gives 0 and -1, so the integral is 1.

3. **2.0**

At $x=0$, $e^0=1$, so $y=2$.

4. **5.0**

$A(2)=8-4+1=5$.

5. **0.125**

The left heights 0 and $1/4$, each of width $1/2$, give $1/8$.

6. **False**

The $n=-1$ power is a separate logarithmic case, not division by zero in the power formula. Keep the sign in the sine antiderivative and divide by the argument coefficient. $\ln x$ alone does not cover negative x . An indefinite integral needs a constant; a definite integral has a numerical value when valid limits are supplied. A real fractional power may restrict the domain.

7. **False**

The integral of $1/x$ is $\ln|x|+C$, not the power rule with $n=-1$. Signed area can be zero even when the total enclosed area is positive.

8. **False**

Choosing u and v prime well matters: the remaining integral should become simpler. In a definite substitution, either change the limits or return to x before applying the original limits.

9. **False**

An initial condition determines the integration constant; it is not a replacement for integrating. Dividing by y can omit an equilibrium solution $y=0$. Euler accuracy depends on step size and the equation.

10. **False**

Subtract the lower antiderivative value even when the lower limit is not zero. A definite integral is signed change, not automatically total positive area. $A'(x)$ is the integrand at the endpoint, not its antiderivative. Continuity on the relevant interval is a sufficient hypothesis; do not integrate across a pole such as $1/t$ at zero. A moving endpoint x^2 also contributes its chain-rule factor.