8. H · Integration

Starter Quiz ·

AQA · A-Level · Mathematics

Name: _____ Score: _____

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. $\int\cos(kx)\,dx=(1/k)\sin(kx)+c$ for $k\neq0$.

   ☐ True ☐ False

7. Area below the axis counts as negative, so a definite integral can be smaller than the total area, or even zero.

   ☐ 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 its accumulated total.

    ☐ True ☐ False

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Answers ·

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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. **True**

   True. $\int\cos(kx)\,dx=(1/k)\sin(kx)+c$ for $k\neq0$; when k=0 the integrand is 1 and the integral is x+c.

7. **True**

   True. Area below the axis counts as negative, so a definite integral can be smaller than the total area, or even zero.

8. **False**

   A product needs a method such as integration by parts or substitution: $\int x\cdot x\,dx=x^3/3$, not $(x^2/2)(x^2/2)$.

9. **False**

   Euler's method depends on the step size; smaller steps usually give a more accurate value.

10. **False**

    The derivative of $\int_a^x f(t)\,dt$ is f(x), the integrand's value at x, not the total.