

Calculus One: Test III Review

I. Find the derivative of each function.

1. $y = \frac{(x^2 - x)^{3/2}(e^{x^2+1})}{\sqrt{2x-1}}$

2. $y = 2x^{1/2x}$

3. $e^{2y} = (\sin x)(\arcsin e^{2y})$

$$4. y = \ln \frac{(x^2 - e^{x^3})^{1/2}}{(25 - e^{-x})^2}$$

II. Evaluate each integral.

$$1. \int \left(6x^5 + 4x - \frac{1}{3}x^{1/3} + \frac{1}{\sqrt{x}} - \frac{1}{x^2} + \frac{1}{x} \right) dx$$

$$2. \int \frac{u-1}{u^2+9} du$$

3. $\int (3x-4)^5 dx$

4. $\int x \ln x dx$

5. $\int x^2 e^{4x^3} dx$

6. $\int_e^{e^2} \frac{dx}{x \ln x}$

7. $\int_{-\pi/6}^{\pi/6} \frac{\arctan 2x}{1+4x^2} dx$

8. $\int \frac{2x+1}{(x+5)^3} dx$

9. $\int \frac{dx}{\sqrt{16-6x-x^2}}$

10. $\int \frac{dx}{4x^2+16x+41}$

11. $\int x \arctan x \, dx$