

I. FIND EACH INDEFINITE INTEGRAL.

1. $\int (4\sqrt{x} - 6x^2 + 7) dx$

2. $\int \left(\frac{1}{\sqrt{x}} - \frac{1}{\sqrt[3]{x}} \right) dx$

3. $\int (8x \cos(2x^2)) dx$

4. $\int \left(\frac{x-1}{\sqrt[3]{x+5}} \right) dx$

5. $\int \sec(x) (\cos^2(x) + \sec(x)) dx$

6. $\int x e^{2x^2+1} dx$

7. $\int \frac{x+2}{3x^2+12x+17} dx$

8. $\int \frac{1}{e^{\sqrt{x}} \sqrt{x}} dx$

II. EVALUATE EACH DEFINITE INTEGRAL.

1. $\int_{-2}^1 (8x^3 - 6x) dx$

2. $\int_1^3 8x (\sqrt[3]{x^2-1}) dx$

3. $\int_{-1}^0 (x+2)(3-x)^4 dx$

4. $\int_{-\pi/4}^{\pi/4} 4 \cos(2x) dx$

III. FIND THE DERIVATIVE OF EACH FUNCTION.

1. $f(x) = \ln(\cos(x))$

2. $f(x) = x^{x^2-3} e^{2x}$

3. $f(x) = \frac{e^x + 1}{\ln(x)}$

4. $f(x) = e^{\sqrt{1+x}}$

5. $f(x) = \ln(\sqrt{x^3-1})$

6. $f(x) = x^2 \ln(x^3)$