

AP Calculus Quiz 6.2 & 6.3 REVIEW

1. Evaluate the following indefinite integrals

$$\int (1 + x^3)(4 - x) dx$$

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

$$\int \frac{\cos^3 x - 8}{\cos^2 x} dx$$

$$\int \frac{x^4 + 3x^2 + 4x + 2}{x^2} dx$$

$$\int \frac{x^2 - 4}{\sqrt[3]{x^2}} dx$$

$$\int \frac{2}{1+x^2} + \csc x (\csc x + \cot x) dx$$

$$\int \frac{1}{x^2} + 2x^2 + \frac{3}{\cos^2 x} dx$$

$$\int 2e^x + \sqrt{x} dx$$

$$\int (x^2 - 6)^2 dx$$

2. Evaluate the following indefinite integrals using u-substitution

$$\int x\sqrt{1-5x^2} dx$$

$$\int \frac{x^3}{3x^4 - 2} dx$$

$$\int \sin 5x \cdot \cos 5x dx$$

$$\int \sin(e^{3x}) \cdot e^{3x} dx$$

$$\int \frac{x}{(4x^2 + 1)^3} dx$$

$$\int \frac{\csc \sqrt{x} \cot \sqrt{x}}{\sqrt{x}} dx$$

$$\int x^3 \sin(x^4 + 2) dx$$

$$\int \frac{20x^4}{(x^5 + 1)^2} dx$$

$$\int \frac{e^x}{1+e^x} dx$$

$$\int \tan x dx$$

$$\int \tan(3x) \sec^2(3x) dx$$

3. Evaluate the following indefinite integrals using inverse trig rules or double substitution

$$\int \frac{1}{\sqrt{1-4x^2}} dx$$

$$\int \frac{4}{x\sqrt{25x^2-1}} dx$$

$$\int \frac{36}{1+16x} dx$$

$$\int \frac{2x-1}{\sqrt{x+3}} dx$$

$$\int x \cdot \sqrt[3]{x+1} dx$$

$$\int x^2 \sqrt{x-2} dx$$

4. Find the derivative and state a corresponding integration formula.

$$\frac{d}{dx} [\sqrt{5x^2 - 3x + 1}]$$

5. Solve the initial value problem.

$$\frac{dy}{dx} = \sec^2 x - \sin x, \quad y\left(\frac{\pi}{4}\right) = 1$$

6. Solve the initial value problem.

$$\frac{dy}{dx} = xe^{x^2}, \quad y(0) = 0$$

7. Find a function f such that $f'(x) = 6 - 5\sin(2x)$ and $f(0) = 3$.