

Due date: _____

Name: _____

1. Find the most general antiderivative of each of the following functions.

a) $f(x) = x^{-3}(x^7 - 3x^4 + x + 4)$ (Hint: distribute first)

b) $f(x) = 4 \sec x \tan x - 3e^x + \frac{5}{x} - \sqrt[3]{x}$

c) $f(x) = 2 \csc^2 x + \cos 4x - \frac{2}{x^2} + \frac{5}{\sqrt[3]{x}}$

d) $f(x) = \frac{1}{2x} + \frac{2}{\sqrt{x}} - \sin 3x - 4 \sec^2 x$

2. Evaluate the following integrals.

a) $\int x^{-3}(x+1) dx$

b) $\int \left(\frac{1}{\sqrt[3]{x}} + \sqrt[4]{x^3} \right) dx$

c) $\int \left(\frac{2}{x} + e^{-5x} \right) dx$

d) $\int \left(-\frac{\sec^2 4x}{3} \right) dx$

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

$$f) \int (3^x - \csc 5x \cot 5x) dx$$

$$g) \int (\sin 2x - \csc^2 x + \cosh x + \operatorname{sech}^2 x) dx$$

$$h) \int \left(\frac{2}{x} + \frac{4}{x^2} + \frac{3\sqrt[3]{x}}{4} + x\sqrt{x} - 2 \cos 5x - \csc^2 3x \right) dx$$

$$i) \int \left(x^{10} - \frac{2}{x^3} + \frac{1}{3\sqrt{x}} + \pi - \frac{e^{5x}}{3} - \sec 2x \tan 2x \right) dx$$

3. Find f if $f''(x) = 3x^2 - x + 5$.

4. Find f if $f'(x) = \frac{3}{\sqrt{1-x^2}}$ and $f(0) = 4$.

5. For each of the following parts, a particle is moving with the given data. Find a function $s(t)$ that represents the position of the particle as a function of time t .

a) $v(t) = 2t^2 - \sqrt{t}$, $s(4) = 5$

b) $v(t) = \frac{4}{1+t^2}$, $s(1) = 0$

c) $a(t) = t + \frac{1}{t^2}$, $s(2) = 3$, $v(1) = 1$ ($t > 0$)

d) $a(t) = 5 \sin t - 2 \cos t$, $s(0) = 0$, $s(2\pi) = 4$

6. True or false: $\int \frac{1}{(3x+5)^2} dx = -\frac{1}{3(3x+5)} + C$

7. True or false: $\int x \sin x dx = -\frac{x^2}{2} \cos x + C$

Q: Solve the following equation with an anagram (that is, rearrange the letters): ELEVEN PLUS TWO = ??

Optional exercises from the Stewart textbook if you'd like more practice:

4.9 (p.355) #1-21 odd, 25-51 odd, 59-63 odd

5.4 (p.408) #5-15 odd