

Review 6.1 to 6.3

1. Evaluate the integral $\int (x^{-3} + 8x^3 - \sec^2 x) dx$
2. Solve the initial value problem. \longrightarrow
Support your answer by overlaying your solution on a slope field for the differential equation.

$\frac{dy}{dx} = x^3 - 2x$ $y(2) = 3$

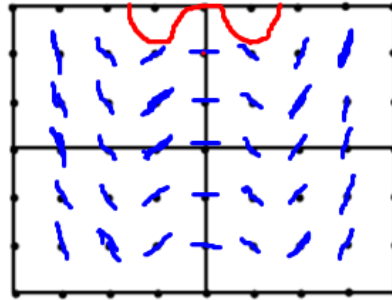
3. What u-substitution would be useful in evaluating
$$\int \csc^2(5x + 2) dx$$
4. Use u-substitution to evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \sin^5 x \cos x dx$
5. Evaluate using integration by parts $\int 8xe^{4x} dx$
6. Evaluate using tabular integration $\int 2x^3 \sin(3x) dx$

Answers

1. $-\frac{1}{2x^2} + 2x^4 - \tan x + C$

2. $\frac{1}{4}x^4 - x^2 + 3$ (w-shaped curve)

3. $u = 5x + 2$



4. $\frac{21}{128}$

Let $u = \sin x$, then $du = \cos x dx$

So $\int u du$ or better yet $\int_{1/2}^1 u^5 du$

5. $2xe^{4x} - \frac{1}{2}e^{4x} + C$

Let $u = 8x$ and $dv = e^{4x} dx$

6. $-\frac{2}{3}x^3 \cos(3x) + \frac{2}{3}x^2 \sin(3x) + \frac{4}{9}x \cos(3x) - \frac{4}{27} \sin(3x) + C$