Name: _____ Problem Set #1

Show all work leading to your answer

1. Evaluate: $\int \frac{1}{\sqrt{2x+3}} dx$

2. $\int \frac{2\sin x}{\cos^4 x} dx =$

3. Evaluate: $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} (3\sin x - \csc^2 x) dx$

4. If $\int_0^3 f(x)dx = 6$ and $\int_3^5 f(x)dx = 4$,

   then $\int_0^5 (3 + 2f(x))dx =$

5. $\frac{d}{dx}\left[\int_x^2 \ln(1+t)dt\right]$

6. If $\int_1^k \frac{1}{\sqrt{x}} dx = 4$ then k =

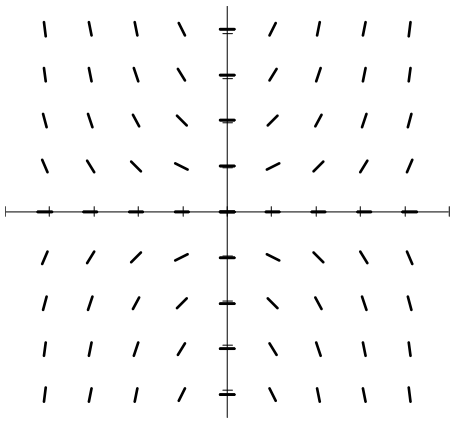
7. Solve the differential equation $\frac{dy}{dx} = \frac{4x}{y}$,

   where $y(2) = -2$

8. If $\frac{dy}{dx} = \sin(3x-3) + 4$ and $y(1) = 7$, Find y.

9. If $\int_a^b g(x)dx = 4a + b$, then find $\int_a^b (g(x) + 7)dx =$

10. Which of the following differential equations corresponds to the slope field shown in the figure at the right?



(A) $\frac{dy}{dx} = \frac{xy}{2}$ (B) $\frac{dy}{dx} = \frac{y}{x}$ (C) $\frac{dy}{dx} = -\frac{y}{x}$

(D) $\frac{dy}{dx} = \frac{x}{y}$ (E) $\frac{dy}{dx} = -\frac{x}{y}$

11.

x	3	6	9	12
$f(x)$	3	2	4	5

Let f be a continuous function with values as represented in the table above. Approximate $\int_3^{12} f(x)dx$ (the area under f(x)) by using a right-hand rectangles with three subintervals of equal length.