BC CALCULUS PRACTICE 6.2B/6.3A **Name:** ______________________________ **Period** ________

Aisle : _________

6.2: pg. 363 – 39, 41, 43, 59a, 61, 63, 65
6.3: pg. 371 – 1, 9, 13, 17, 21, 25

Pg.363

39.
Suppose that a point moves along a curve $y = f(x)$ in the xy-plane in such a way that at each point (x, y) on the curve the tangent line has slope $-\sin x$. Find an equation for the curve, given that it passes through the point $(0, 2)$.

41. Solve each initial-value problem.

(a) $\dfrac{dy}{dx} = \sqrt[3]{x},\ y(1) = 2$

(b) $\dfrac{dy}{dt} = \sin t + 1,\ y\left(\dfrac{\pi}{3}\right) = \dfrac{1}{2}$

(c) $\dfrac{dy}{dx} = \dfrac{x+1}{\sqrt{x}},\ y(1) = 0$

43.
Find the general form of a function whose second derivative is $\sqrt{x}$. [*Hint:* Solve the equation $f''(x) = \sqrt{x}$ for $f(x)$ by integrating both sides twice.]

59a. Let F and G be the functions defined by

$$F = \frac{x^2 + 3x}{x};\ G = \begin{cases} x + 3, & x > 0 \\ x, & x < 0 \end{cases}$$

Show that F and G have the same derivative.

61. Use a trigonometric identity to evaluate the integral.

$$\int tan^2 x\, dx$$

63.

Use the identities $\cos 2\theta = 1 - 2\sin^2\theta = 2\cos^2\theta - 1$ to help evaluate the integrals

(a) $\displaystyle\int \sin^2(x/2)\,dx$ (b) $\displaystyle\int \cos^2(x/2)\,dx$

Pg. 371

1. Evaluate the integrals by making the indicated substitutions.

(a) $\displaystyle\int 2x\left(x^2+1\right)^{23}\,dx;\ u = x^2+1$

(b) $\displaystyle\int \cos^3 x \sin x\,dx;\ u = \cos x$

(c) $\displaystyle\int \frac{1}{\sqrt{x}} \sin\sqrt{x}\,dx;\ u = \sqrt{x}$

(d) $\displaystyle\int \frac{3x\,dx}{\sqrt{4x^2+5}};\ u = 4x^2+5$

Evaluate using appropriate substitutions.

9. $\int (4x-3)^9 dx$	13. $\int \sec 4x \tan 4x \, dx$
17. $\int \frac{dx}{\sqrt{1-4x^2}}$	21. $\int \frac{6}{(1-2x)^3} dx$
25. $\int e^{\sin x} \cos x \, dx$	