Who is this? Kay

AP Calculus AB: 6.2 Trigonometry Integrals & Particular Solutions

1. Find the particular solution of the following equations given the point.

a) $f'(x) = 3x^2 - 2$ and f(2)=4

$f(x) = \frac{3x^3}{3} - 2x + C$ $\quad f(x) = x^3 - 2x$

$4 = (2)^3 - 2(2) + C$

$C = 0$

b) $f'(x) = x + 4$ and f(4)=48

$f(x) = \frac{x^2}{2} + 4x + C$ $\quad f(x) = \frac{x^2}{2} + 4x + 24$

$48 = \frac{(4)^2}{2} + 4(4) + C$

$48 = 8 + 16 + C$

$48 = 24 + C \quad C = 24$

2. Find the integral of the following trigonometric functions.

a) $\int 4\cos(x)\,dx$

$4\sin(x) + C$

b) $\int \frac{\sin(x)}{2}\,dx$

$\frac{-\cos(x)}{2} + C$

c) $\int -3\cos(x) + 2\,dx$

$3\sin(x) + 2x + C$

d) $\int -\sec^2(x)dx$

$-\tan(x) + C$

e) $\int \csc(x)\cot(x)\,dx$

$-\csc(x) + C$

f) $\int (-\csc(x)^2 - 5x)\,dx$

$\cot(x) - \frac{5x^2}{2} + C$

g) $\int \frac{3}{\sin^2(x)}\,dx$

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

$3\tan(x) + C$

h) $\int \frac{1}{2\cos^2(x)}\,dx$

$\int \frac{1}{2}\sec^2(x)\,dx$

$\frac{1}{2}\tan(x) + C$

j) $\int \frac{\sin(x)}{\cos^2(x)} + 3x^2\,dx$

$\int \frac{\sin}{\cos} \cdot \sec + 3x^2\,dx$

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

$\sec(x) + \frac{3x^3}{3} + C$

$\sec(x) + x^2 + C$

3. Find the particular solution of the f(x) if $f'(x) = 2\cos(x)$ and the function f(x) passes through the point $(\frac{4\pi}{3}, \sqrt{3})$.

$f(x) = 2\sin(x) + 2\sqrt{3}$

$f(x) = 2\sin(x) + C$

$\sqrt{3} = 2\sin(\frac{4\pi}{3}) + C$

$\sqrt{3} = 2(\frac{-\sqrt{3}}{2}) + C$

$\sqrt{3} = -\sqrt{3} + C \quad C = 2\sqrt{3}$

S | A
T | C

4. The acceleration of a particle is given by a function $a(t) = 3t^2 - 6$. If the particle's velocity is 5 when it's time is t=1. What is the formula to find velocity?

$v(t) = t^3 - 6t + 10$

$v(t) = \frac{3t^3}{3} - 6t + C$

$5 = \frac{3(1)^3}{3} - 6(1) + C$

$5 = 1 - 6 + C$

$5 = -5 + C \quad C = 10$