7.2 Verifying Solutions for Differential Equations

Calculus   Name: _____

CA #1

| **For each differential equation, find the particular solution that passes through the given point.** |

1. $\frac{dy}{dx} = \frac{12}{3x-2} - \frac{1}{x^2}$; $(1, -3)$

2. $\frac{dy}{dx} = 10\sin(5x)$; $\left(\frac{\pi}{5}, 1\right)$

3. $\frac{dy}{dx} = 6e^{2x} - 4x$; $(0, -2)$

4. $\frac{d^2y}{dx^2} = \sin(2x)$ and $y'\left(\frac{\pi}{6}\right) = \frac{5}{4}$ and $y\left(\frac{\pi}{2}\right) = \pi$

5. $\frac{d^2y}{dx^2} = e^{2x} + 4x$ and $y'(0) = 2$ and $y(0) = \frac{3}{4}$

6. For what value of k, if any, will
$y = ke^{-3x} + 8\sin(2x)$ be a solution to the
differential equation $y'' + 4y = 26e^{-3x}$?

7. For what value of k, if any, will
$y = k\cos(3x) - \sin(5x)$ be a solution to the
differential equation $y'' + 25y = 8\cos(3x)$?

<div align="center">Answers to 7.2 CA #1</div>

1. $y = 4\ln\lvert 3x - 2\rvert + \frac{1}{x} - 4$		2. $y = -2\cos(5x) - 1$	3. $y = 3e^{2x} - 2x^2 - 5$
4. $y = -\frac{1}{4}\sin(2x) + \frac{3}{2}x + \frac{\pi}{4}$	5. $y = \frac{1}{4}e^{2x} + \frac{2}{3}x^3 + \frac{3}{2}x + \frac{1}{2}$	6. $k = 2$	7. $k = \frac{1}{2}$