

1) Solve

$$\frac{dy}{dx} = \sin x - 4x^3$$

for $y = y(x)$ subject to the initial condition
 $y(0) = 7$.

2) Solve

$$\frac{d^2y}{dx^2} = 5x + 3$$

for $y = y(x)$ subject to the initial conditions
 $y(0) = 3$ and $y'(0) = -4$.

Problems 3 through 6 are matching four slope fields
 to four differential equations. See Example 8 on
 pgs. 332 and 333 of the text.

7) Solve

$$\frac{dy}{dx} = -\frac{y}{2\sqrt{x}}$$

for $y = y(x)$ subject to the initial condition
 $y(0) = 6$.

8) Solve

$$\frac{dy}{dx} - 5y = 3x^2 e^{5x}$$

for $y = y(x)$ subject to the initial condition
 $y(0) = 2$.

For problems 9 and 10, evaluate the indefinite
 integrals using substitution.

9)

$$\int \frac{dx}{x \ln x}$$

10)

$$\int x^2 \sec(4x^3) \tan(4x^3) dx$$

For problems 11 and 12, evaluate the definite
 integrals using substitution.

11)

$$\int_0^{\pi/6} \sin x \sec(\cos x) \tan(\cos x) dx$$

12)

$$\int_0^{\pi/3} \sec^2 x \tan x \sin(\sec^2 x) dx$$