# 2.6 Substitutions and Transformations

Name:                                                                    Date: May 28, 2013

**P 11.** Solve

$$(y^2 - xy)\, dx + x^2\, dy = 0$$

**P 12.** Solve

$$(x^2 + y^2)\, dx + 2xy\, dy = 0$$

**P 13.** Solve

$$\frac{dx}{dt} = \frac{x^2 + t\sqrt{t^2 + x^2}}{tx}$$

**P 15.** Solve

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

**P 18.** Solve

$$\frac{dy}{dx} = (x + y + 2)^2$$

**P 19.** Solve

$$\frac{dy}{dx} = (x - y + 5)^2$$

**P 20.** Solve

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

**P 21.** Solve

$$\frac{dy}{dx} + \frac{y}{x} = x^2 y^2$$

**P 22.** Solve

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

**P 23.** Solve

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

**P 24.** Solve

$$\frac{dy}{dx} + \frac{y}{x-2} = 5(x-2)y^{1/2}$$

**P 25.** Solve

$$\frac{dx}{dt} + tx^3 + \frac{x}{t} = 0$$

**P 26.** Solve

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

**P 27.** Solve

$$\frac{dr}{d\theta} = \frac{r^2 + 2r\theta}{\theta^2}$$

**P 28.** Solve

$$\frac{dy}{dx} + y^3 x + y = 0$$

**P 31.** Solve

$$(2x - y)\,dx + (4x + y - 3)\,dy = 0$$

**P 32.** Solve
$$(2x + y + 4)\, dx + (x - 2y - 2)\, dy = 0$$

**P 42.** Use the substitution $y = vx^2$ to solve
$$\frac{dy}{dx} = \frac{2y}{x} + \cos(y/x^2)$$

**P 41.** Use the substitution $v = x - y + 2$ to solve

$$\frac{dy}{dx} = y - x - 1 + (x - y + 2)^{-1}$$