

Assignment # 5 (NYA ELECTRO)

9th Edition

P. 686 #12, 17, 18, 23

P. 828 #32

P. 816 #32, 33

8th Edition

P. 683 #8, 13, 15, 19

P. 828 #34

P. 818 #32, 33

SOLUTIONS

P. 683

#8 $x^2 + 2y^2 - 11 = 0$

$$2x + 4yy' = 0$$

$$4yy' = -2x$$

$$y' = \frac{-2x}{4y}$$

$$\boxed{y' = \frac{-x}{2y}}$$

#13 $y + 3xy - 4 = 0$

$$y' + 3y + y'3x = 0$$

$$y' + 3xy' = -3y$$

$$y'(1+3x) = -3y$$

$$\boxed{y' = \frac{-3y}{1+3x}}$$

#15 $xy^3 + 3y + x^2 = 2\pi^2$

$$y^3 + 3y^2y'x + 3y' + 2x = 0$$

$$(3y^2x + 3)y' = -2x - y^3$$

$$\boxed{y' = \frac{-2x - y^3}{3xy^2 + 3}}$$

#19 $(2y-x)^4 + x^2 = y + 3$

$$4(2y-x)^3(2y'-1) = y'$$

$$8y^3(2y-x)^3 - 4(2y-x)^3 = y'$$

$$8y^3(2y-x)^3 - y' = 4(2y-x)^3$$

$$y'(8(2y-x)^3 - 1) = 4(2y-x)^3$$

$$\boxed{y' = \frac{4(2y-x)^3}{8(2y-x)^3 - 1}}$$

p. 818

#32 $3 \ln xy + \sin y = x^2$

$$\frac{3}{xy} (y + xy') + \cos y y' = 2x$$

$$\frac{3y}{xy} + \frac{3xy'}{xy} + \cos y y' = 2x$$

$$\frac{3}{x} + \frac{3y'}{y} + \cos y y' = 2x$$

$$y' \left(\frac{3}{y} + \cos y \right) = 2x - \frac{3}{x}$$

$$y' \left(\frac{3 + y \cos y}{y^2} \right) = \frac{2x^2 - 3}{x^2}$$

$$y' = \left(\frac{2x^2 - 3}{x^2} \right) \left(\frac{y^2}{3 + y \cos y} \right)$$

#33 $y = x - \ln^2(x+y)$

$$y' = 1 - 2 \ln(x+y) \cdot \frac{1}{x+y} (1+y')$$

$$y' = 1 - \frac{2 \ln(x+y)}{x+y} - \frac{2 \ln(x+y)}{x+y} y'$$

$$y' + \frac{2 \ln(x+y)}{x+y} y' = 1 - \frac{2 \ln(x+y)}{x+y}$$

$$y' \left(1 + \frac{2 \ln(x+y)}{x+y} \right) = \frac{1 - 2 \ln(x+y)}{x+y}$$

$$y' = \frac{x+y - 2 \ln(x+y)}{x+y + 2 \ln(x+y)}$$

p. 828 #34

$$3y + \ln xy = 2 + x^2$$

$$3y' + \frac{1}{xy} (y + xy') = 2x$$

$$3y' + \frac{1}{x} + \frac{y'}{y} = 2x$$

$$y' \left(3 + \frac{1}{y} \right) = 2x - \frac{1}{x}$$

$$y' \left(\frac{3y+1}{y} \right) = \frac{2x^2-1}{x}$$

$$y' = \frac{y(2x^2-1)}{x(3y+1)}$$