Answers to Worksheet 21 - Separable Differential Equations

1) $\frac{e^{2y}}{2} = x^2 + C_1$

$y = \frac{\ln\left(2x^2 + C\right)}{2}$

2) $\frac{y^3}{3} = 3e^x + C_1$

$y = \sqrt[3]{9e^x + C}$

3) $\ln\left|y\right| = 3x^4 + C_1$

$y = Ce^{3x^4}$

4) $\ln\left|y + 1\right| = \ln\left|x\right| + C_1$

$y = Cx - 1$

5) $\ln\left|y\right| = \ln\left(x^2 + 2\right) + C_1$

$y = C\left(x^2 + 2\right)$

6) $\frac{y^3}{3} = \frac{x^4}{4} + \frac{2}{3}$

$y = \sqrt[3]{\frac{3x^4}{4} + 2}$

7) $e^y = 2e^x + 3$

$y = \ln\left(2e^x + 3\right)$

8) $\ln\left|y\right| = x^4$

$y = -e^{x^4}$

9) $\frac{y^3}{3} = 3x + \frac{x^3}{3}$

$y = \sqrt[3]{x^3 + 9x},\ x > 0$

10) $\ln\left|y\right| = x^3$

$y = e^{x^3}$