

## Differential General Solutions Worksheet 1

Date \_\_\_\_\_ Period \_\_\_\_\_

**Find the general solution of each differential equation.**

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

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

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

4)  $\frac{dy}{dx} = -\frac{1}{\sin y}$

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

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

7)  $\frac{dy}{dx} = \frac{e^x}{y^2}$

$$8) \frac{dy}{dx} = \frac{x^2}{e^{2y}}$$

$$9) \frac{dy}{dx} = xe^y$$

$$10) \frac{dy}{dx} = \frac{-2 + x^2}{y^2}$$

$$11) \frac{dy}{dx} = \frac{3x^2}{e^{2y}}$$

$$12) \frac{dy}{dx} = \frac{-3 + x^2}{y^2}$$

$$13) \frac{dy}{dx} = \frac{x}{e^y}$$

$$14) \frac{dy}{dx} = \frac{1}{\cos y}$$

## Answers to Diiferentials General Solutions Worksheet 1 (ID: 1)

$$1) \begin{aligned} e^y &= 3e^x + C \\ y &= \ln(3e^x + C) \end{aligned}$$

$$2) \begin{aligned} e^y &= x^2 + C \\ y &= \ln(x^2 + C) \end{aligned}$$

$$3) \begin{aligned} \frac{y^3}{3} &= \frac{x^4}{4} + C_1 \\ y &= \sqrt[3]{\frac{3x^4}{4} + C} \end{aligned}$$

$$4) \begin{aligned} \cos y &= x + C \\ y &= \cos^{-1}(x + C) \end{aligned}$$

$$5) \begin{aligned} \frac{y^3}{3} &= -x + \frac{x^3}{3} + C \\ y &= \sqrt[3]{x^3 - 3x + C} \end{aligned}$$

$$6) \begin{aligned} \frac{y^3}{3} &= \frac{2x^3}{3} + C_1 \\ y &= \sqrt[3]{2x^3 + C} \end{aligned}$$

$$7) \begin{aligned} \frac{y^3}{3} &= e^x + C_1 \\ y &= \sqrt[3]{3e^x + C} \end{aligned}$$

$$8) \begin{aligned} \frac{e^{2y}}{2} &= \frac{x^3}{3} + C_1 \\ y &= \frac{\ln\left(\frac{2x^3}{3} + C\right)}{2} \end{aligned}$$

$$9) \begin{aligned} -e^{-y} &= \frac{x^2}{2} + C_1 \\ y &= -\ln\left(-\frac{x^2}{2} + C\right) \end{aligned}$$

$$10) \begin{aligned} \frac{y^3}{3} &= -2x + \frac{x^3}{3} + C_1 \\ y &= \sqrt[3]{x^3 - 6x + C} \end{aligned}$$

$$11) \begin{aligned} \frac{e^{2y}}{2} &= x^3 + C_1 \\ y &= \frac{\ln(2x^3 + C)}{2} \end{aligned}$$

$$12) \begin{aligned} \frac{y^3}{3} &= -3x + \frac{x^3}{3} + C_1 \\ y &= \sqrt[3]{x^3 - 9x + C} \end{aligned}$$

$$13) \begin{aligned} e^y &= \frac{x^2}{2} + C \\ y &= \ln\left(\frac{x^2}{2} + C\right) \end{aligned}$$

$$14) \begin{aligned} \sin y &= x + C \\ y &= \sin^{-1}(x + C) \end{aligned}$$