

Worksheet: Separable Differential Equations

This worksheet has questions on separable differential equations. Before attempting the questions below, you could read the study guide: [Separable Differential Equations](#).

Separable
Differential Equations
study guide



Model Answers
to this worksheet



1. If it is possible, separate the variables in the following differential equations so that they're in the form $g(y) = f(x)$:

a. $\frac{dy}{dx} = x$

b. $\frac{dy}{dx} = 5y$

c. $\frac{dy}{dx} = 4 + 2x$

d. $\frac{dy}{dx} + 3y = 2x$

e. $\frac{dy}{dx} = \frac{\sin(y)}{e^x}$

f. $x^2 \frac{dy}{dx} - 5 = 2yx$

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

h. $\frac{dy}{dx} + y \cos(x) = 0$

i. $\frac{dy}{dx} = \frac{x^2 + 3y^2}{2xy}$

2. Find the **general solution** to the following ordinary differential equations using separation of variables, so that they're in the form $g(y) = f(x)$,

a. $\frac{dy}{dx} = 6x$

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

c. $\frac{1}{\sin(x)} \frac{dy}{dx} = y$

d. $2y \frac{dy}{dx} = 4(x^2 + 1)$

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

f. $(x^2 + 1) \frac{dy}{dx} = 2xy$

3. Find the **particular solution** to the differential equations in question 3 d, e, and f with the initial condition $y(0) = 2$.



This worksheet is one of a series on
mathematics produced by the
[Learning Enhancement Team](#).

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