



QUESTION WORKBOOK

First order equations and integrating factors

Differential equations · Year FM

6 questions · 21 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

- A1** For an equation in the form $\frac{dy}{dx} + P(x)y = Q(x)$, write down the integrating factor and state what multiplying by it achieves. [2]

- A2** Write down the integrating factor for $\frac{dy}{dx} + y \tan x = \cos x$, simplifying it. [3]

SECTION B · Standard

- B1** Solve $\frac{dy}{dx} + \frac{y}{x} = 6x$ for $x > 0$, given $y(1) = 3$. [5]

B2 Find the general solution of $dy/dx - 2y = e^{5x}$. [4]

B3 Solve $dy/dx + 4y = 8$, and describe the behaviour of every solution as x grows. [3]

SECTION C · Stretch

C1 Solve $dy/dx + 2xy = 4x$. [4]