

Section 2: Integrating factors

Crucial points

1. **Always write the differential equation in the standard form before finding the integrating factor**

The standard form is $\frac{dy}{dx} + Py = Q$

2. **Be careful with exponentials and logarithms when finding the integrating factor**

Remember

$$e^{\ln x} = x$$

$$e^{a \ln x} = e^{\ln x^a} = x^a$$

3. **Remember to multiply the right-hand side of the equation by the integrating factor**

This is an easy mistake to make!

4. **Remember the arbitrary constant when integrating the right-hand side of the differential equation**

Just as for any indefinite integral, it's easy to forget the arbitrary constant of integration. Don't do it!