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Assignment Math45-Module-05-Exercises due 09/24/2020 at 11:59pm PDT

Which of the following is the integrating factor?

- A. $e^{\int Q dx}$
- B. $e^{-\int Q dx}$
- C. $e^{\int P dx}$
- D. $e^{-\int P dx}$

The motivation for the integrating factor is so that $e^{\int P dx}(y' + Py)$ becomes which of the following?

- A. $e^{-\int Pdx} \int e^{\int Pdx} y dx$
- B. $\frac{d}{dx} \left(e^{\int Q dx} y \right)$

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• C.
$$\frac{d}{dx} \left(e^{\int P dx} y \right)$$

• D.
$$\frac{d}{dx} \left(e^{-\int P dx} y \right)$$

3. (1 point) The differential equation $\frac{dy}{dx} = 9y$ is a linear differential equation.

Convert the equation to standard form (use the prime notation for the derivative):

The integrating factor is:

1

After multiplying both sides by the integrating factor and unapplying the product rule we get the new differential equation:

 $\frac{d}{dx}$ [_____] = ____ = C

Integrating both sides we get algebraic equation ____ = C

Solving for y, the solution to the differential equation is y =

4. (1 point) Solve the differential equation by the method of integrating factors.

$$\frac{dy}{dx} + 2xy = 2x$$

y = _____ Use "C" to represent any constant of integration.