

1.(1 pt) Find the particular solution of the differential equation

$$\frac{dy}{dx} + 8y = 3$$

satisfying the initial condition $y(0) = 0$.

Answer: $y =$ _____

Your answer should be a function of x .

2.(1 pt) GUESS one function $y(t)$ which solves the problem below, by determining the general form the function might take and then evaluating some coefficients.

$$3t \frac{dy}{dt} + y = t^4$$

Find $y(t)$.

$y(t) =$ _____

3.(1 pt) GUESS one function $y(t)$ which solves the problem below, by determining the general form the function might take and then evaluating some coefficients.

$$\frac{dy}{dt} + 4y = \exp(4t)$$

Find $y(t)$.

$y(t) =$ _____

4.(1 pt) Find the function satisfying the differential equation

$$y' - 2y = -2e^{0t}$$

and $y(0) = -1$.

5.(1 pt) Solve the following initial value problem:

$$t \frac{dy}{dt} + 8y = 3t$$

with $y(1) = 2$.

(Find y as a function of t .)

$y =$ _____

6.(1 pt) Solve the following initial value problem:

$$\frac{dy}{dt} + (0.5)t y = 4t$$

with $y(0) = 8$.

(Find y as a function of t .)

$y =$ _____

7.(1 pt) Solve the initial value problem

$$8(t+1) \frac{dy}{dt} - 6y = 12t,$$

for $t > -1$ with $y(0) = 17$.

$y =$ _____

8.(1 pt) Find the particular solution of the differential equation

$$\frac{dy}{dx} + y \cos(x) = 8 \cos(x)$$

satisfying the initial condition $y(0) = 10$.

Answer: $y =$ _____

Your answer should be a function of x .

9.(1 pt) Solve the initial value problem

$$\frac{dy}{dt} - y = 2 \exp(t) + 4 \exp(2t)$$

with $y(0) = 9$.

$y =$ _____

10.(1 pt) Solve the initial value problem

$$\frac{dy}{dt} + 2y = 40 \sin(t) + 10 \cos(t)$$

with $y(0) = 6$.

$y =$ _____

11.(1 pt) Solve the following initial value problem:

$$9 \frac{dy}{dt} + y = 9t$$

with $y(0) = 6$.

(Find y as a function of t .)

$y =$ _____

12.(1 pt) Solve the initial value problem

$$5(\sin(t) \frac{dy}{dt} + (\cos(t)y) = (\cos(t))(\sin(t))^5,$$

for $0 < t < \pi$ and $y(\pi/2) = 7$.

$y =$ _____

13.(1 pt) A. Let $g(t)$ be the solution of the initial value problem

$$2t \frac{dy}{dt} + y = 0, t > 0,$$

with $g(1) = 1$.

Find $g(t)$.

$g(t) =$ _____

B. Let $f(t)$ be the solution of the initial value problem

$$2t \frac{dy}{dt} + y = t^4$$

with $f(0) = 0$.

Find $f(t)$.

$f(t) =$ _____

(Hint: you can try to guess this solution.)

C. Find a constant c so that

$$k(t) = f(t) + cg(t)$$

solves the differential equation in part B and $k(1) = 13$.

$c =$ _____

14.(1 pt) A. Let $g(t)$ be the solution of the initial value problem

$$\frac{dy}{dt} + 7y = 0,$$

with $y(0) = 1$.

Find $g(t)$.

$g(t) =$ _____

B. Let $f(t)$ be the solution of the initial value problem

$$\frac{dy}{dt} + 7y = \exp(5t)$$

with $y(0) = 1/12$.

Find $f(t)$.

$f(t) =$ _____

C. Find a constant c so that

$$k(t) = f(t) + cg(t)$$

solves the differential equation in part B and $k(0) = 19$.

$$c = \underline{\hspace{2cm}}$$

15.(1 pt) Find a family of solutions to the differential equation

$$(x^2 - 1xy)dx + xdy = 0$$

(To enter the answer in the form below you may have to rearrange the equation so that the constant is by itself on one side of the equation.) Then the solution in implicit form is:
the set of points (x, y) where $F(x,y) =$

$$\underline{\hspace{4cm}} = \text{constant}$$