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

$$\frac{dy}{dx} = (x-5)e^{-2y}$$

satisfying the initial condition $y(5) = \ln(5)$.
Answer: y= _____
Your answer should be a function of x.

2.(1 pt) Find the particular solution of the differential equation

$$\frac{x^2}{y^2-6}\frac{dy}{dx} = \frac{1}{2y}$$

satisfying the initial condition $y(1) = \sqrt{7}$.
Answer: y= _____
Your answer should be a function of x.

3.(1 pt) Find u from the differential equation and initial condition.
$\frac{du}{dt} = e^{1.2t-1.8u}$, $u(0) = 3.6$.
u = _____

4.(1 pt) Solve the separable differential equation for u.
$\frac{du}{dt} = e^{6u+6t}$
Use the following initial condition: $u(0) = 12$
u = _____

5.(1 pt) Solve the separable differential equation for u.
$\frac{du}{dt} = e^{2u+8t}$
Use the following initial condition: $u(0) = -13$
u = _____

6.(1 pt) Solve the separable differential equation
$10x - 6y\sqrt{x^2+1}\frac{dy}{dx} = 0$
Subject to the initial condition: $y(0) = 2$
y = _____
(function of x only)

7.(1 pt) Find $f(x)$ if $y = f(x)$ satisfies
$\frac{dy}{dx} = 85yx^{16}$
and the y intercept of the curve $y = f(x)$ is 2.
$f(x)$ = _____

8.(1 pt) Find an equation of the curve that satisfies.
$\frac{dy}{dx} = 85yx^{16}$
and whose y intercept is 6.
$y(x)$ = _____
(function of x)

9.(1 pt) Find the solution of the differential equation

$$3e^{5x}\frac{dy}{dx} = -25\frac{x}{y^2}$$

which satisfies the initial condition $y(0) = 1$
y = _____

10.(1 pt) Find a function y of x such that
$9yy' = x$ and $y(9) = 8$.
y = _____ (function of x)

11.(1 pt) Solve the seperable differential equation.
$4yy' = x$
Use the following initial condition: $y(4) = 7$
x^2 = _____ (function of y)

12.(1 pt) Solve the differential equation
$(y^3x)\frac{dy}{dx} = 1+x$.
Use the initial condition $y(1) = 6$.
Express y^4 in terms of x.
y^4 = _____
(function of x)

13.(1 pt) Solve the seperable differential equation for.
$\frac{dy}{dx} = \frac{1+x}{xy^6}; x > 0$
Use the following initial condition: $y(1) = 5$
y^7 = _____
(function of x)

14.(1 pt) Find the function $y = y(x)$ (for $x > 0$) which satisfies the separable differential equation
$\frac{dy}{dx} = \frac{6+16x}{xy^2}; x > 0$
with the initial condition: $y(1) = 3$
y = _____
(function of x only)

15.(1 pt) Find the solution of the differential equation

$$(\ln(y))^4\frac{dy}{dx} = x^4y$$

which satisfies the initial condition $y(1) = e^2$
y = _____

16.(1 pt) A. Solve the following initial value problem:

$$(t^2-16t+15)\frac{dy}{dt} = y$$

with $y(8) = 1$. (Find y as a function of t.)
y = _____
B. On what interval is the solution valid?
Answer: It is valid for _____ $< t <$ _____ .
C. Find the limit of the solution as t approaches the left end of the interval.
(Your answer should be a number or the word "infinite".)
Answer C: _____
D. Similar to C, but for the right end.
Answer D: _____

17.(1 pt) The differential equation

$$\frac{dy}{dx} = \cos(x)\frac{(y^2+5y+6)}{(3y+8)}$$

has an implicit general solution of the form $F(x,y) = K$.
In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$
Find such a solution and then give the related functions requested.
$F(x,y) = G(x) + H(y) =$

18.(1 pt) The differential equation

$$36\frac{dy}{dx} = (25-x^2)^{-1/2}\exp(-9y)$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

19.(1 pt) The differential equation

$$\frac{dy}{dx} = \frac{18}{(y^{1/3} + 9x^2y^{1/3})}$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

20.(1 pt) The differential equation

$$(5+2\cos(x))\frac{dy}{dx} = \sin(x)\cos(y)$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

21.(1 pt) A.Find y in terms of x if

$$\frac{dy}{dx} = x^6y^{-3}$$

and $y(0) = 9$.

$y(x) =$ _____

B. For what x-interval is the solution defined?

(Your answers should be numbers or plus or minus infinity. For plus infinity enter "PINF" ; for minus infinity enter "MINF".)

The solution is defined on the interval:

_____ $< x <$ _____

22.(1 pt) The differential equation

$$\frac{dy}{dx} = \frac{(4x+4)}{(12y^2+10y+6)}$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

23.(1 pt) The differential equation

$$\exp(y)\frac{dy}{dx} = \frac{(14x+3)}{(0\sin(y) + 10\cos(y))}$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

24.(1 pt) A. Solve the following initial value problem:

$$\cos(t)^2\frac{dy}{dt} = 1$$

with $y(16) = \tan(16)$.

(Find y as a function of t.)

$y =$ _____

B. On what interval is the solution valid?

(Your answer should involve pi.)

Answer: It is valid for _____ $< t <$ _____ .

C. Find the limit of the solution as t approaches the left end of the interval.

(Your answer should be a number or "PINF" or "MINF". "PINF" stands for plus infinity and "MINF" stands for minus infinity.)

Answer C: _____

D. Similar to C, but for the right end.

Answer D: _____

25.(1 pt) The differential equation

$$\frac{dy}{dx} = (30+36x+40y+48xy)$$

has an implicit general solution of the form $F(x,y) = K$.

In fact, because the differential equation is separable, we can define the solution curve implicitly by a function in the form $F(x,y) = G(x) + H(y) = K$

Find such a solution and then give the related functions requested.

$F(x,y) = G(x) + H(y) =$

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