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NPTEL

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Courses » Engineering Mathematics - I

Announcements

Course

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Unit 13 - Week 11 :

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Course outline

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Week 11 :

- Lecture 51 : Differential Equations - Introduction
- Lecture 52 : First Order Differential Equations
- Lecture 53 : Exact Differential Equations
- Lecture 54 : Exact Differential Equations (Cont.)
- Lecture 55 : First Order Linear Differential Equations

Assignment 11

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-04-17, 23:59 IST

1 point

1)

The differential equation corresponding to the family of curves $y = c(x - c)$ where c is an arbitrary constant is

$$(y')^{k_1} = 4y(xy' - 2y)^{k_2}.$$

So, $k_1 + k_2 =$ _____

- a. 1
- b. 2
- c. 3
- d. 4

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

2)

1 point

The solution of differential equation $(2x + y - 3)dy = (x + 2y - 3)dx$

$$(x - y)^p = c(x + y - 2),$$

where c is an arbitrary constant and p is

- a. 3
- b. 3/2
- c. 2
- d. 2/3

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Assignment
Solution

Accepted Answers:

a.

3) Integrating factor of differential equation

1 point

$$(2xy^4e^y + 2xy^3 + y)dx + (x^2y^4e^y - x^2y^2 - 3x)dy = 0$$

is _____.

- a. $-1/y^4$
- b. $1/y^4$
- c. $4/y$
- d. $-4/y$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

4) Given differential equation is

1 point

$$(1 + x^2) \left(\frac{dy}{dx} \right) + 2xy - 4x^2 = 0.$$

If e^k is the integrating factor, then $k =$ _____.

- a. $\ln(1 + x^2)$
- b. $\frac{1}{2}\ln(1 + x^2)$
- c. $\ln(1 + x)$
- d. $\frac{1}{2}\ln(1 + x)$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

5) Let

1 point

$$\frac{y}{A(x)} = \log x + C,$$

where C is an arbitrary constant, is a solution of

$$(x^3 - x) \frac{dy}{dx} - (3x^2 - 1)y = x^5 - 2x^3 + x.$$

Then, A is

- a. $x - x^2$
- b. $x^2 - x$
- c. $x^3 - x$
- d. $x - x^3$

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

6) y^n is the integrating factor of

$$y \sec^2 x dx + \left[3 \tan x - \left(\frac{\sec y}{y} \right)^2 \right] dy = 0,$$

for $n = \underline{\hspace{2cm}}$.

- a. 2
b. 3
c. 4
d. 1

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

7) Equation $(\alpha xy^3 + y \cos x)dx + (x^2y^2 + \beta \sin x)dy = 0$ is exact if

- a. $\alpha = \frac{3}{2}, \beta = 1$
b. $\alpha = 1, \beta = \frac{3}{2}$
c. $\alpha = \frac{2}{3}, \beta = 1$
d. $\alpha = 1, \beta = \frac{2}{3}$

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

8)



1 point

1 point

1 point

Differential equation $xdy - ydx - 2x^3dx = 0$ has the solution

- a. $y + x^3 = C_1x$
- b. $-y + x^3 = C_1x$
- c. $y - x^2 = C_1x$
- d. $y^3 - x^3 = C_1x$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

9)

1 point

If $2\int vdx = v - \log_e(1+v) + A$, where v is a function of x and $v(0) = 1$. Then $1 + v =$ _____.

- a. $2e^x$
- b. e^x
- c. e^{2x}
- d. $2e^{2x}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

10)

1 point

If x^r is an integrating factor of $(x + y^3)dx + 6xy^2dy = 0$, then $r =$ _____.

- a. $-1/2$
- b. $1/2$
- c. $-3/2$
- d. $3/2$

- a.
- b.
- c.
- d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

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