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Courses » Ordinary and Partial Differential Equations and Applications

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Unit 10 - Week 9

Assignment 9

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

Due on 2018-10-03, 23:59 IST.

1) $Complete\ integral\ of\ the\ equation\ p^2q^2+x^2y^2=x^2q^2(x^2+y^2)\ is$ ***1 point***

$3z=(x^2+a^2)^{3/2}+(y^2-a^2)^{3/2}+b$

$3z=(x^2+a^2)^{3/2}+(y^2-a^2)^{1/2}+b$

$3z=(x^2+a^2)^{3/2}+3(y^2-a^2)^{1/2}+b$

$z=(x^2+a^2)^{1/2}+(y^2-a^2)^{3/2}+b$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$3z=(x^2+a^2)^{3/2}+3(y^2-a^2)^{1/2}+b$

2) $Complete\ integral\ of\ zpq=p+q\ is$ ***1 point***

$z^2=2\left(1+\frac{1}{a}\right)(ax+y)+b\ where\ a\ and\ b\ are\ arbitrary\ constants$

$z=ax+y+b\ where\ a\ and\ b\ are\ arbitrary\ constants$

$z=(ax-y)^2+b\ where\ a\ and\ b\ are\ arbitrary\ constants$

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$z^2 = 2\left(1+\frac{1}{a}\right)(ax+y)+b$ *where a and b are arbitrary constants*

3) **1 point**

If

$z = f(x^2-y)+g(x^2+y),$

then the PDE obtained by eliminating arbitrary functions f *and* g *is given by*

- $r - \frac{1}{x}p = 4x^2t$
- $r - \frac{1}{x}p = 4xt$
- $r - \frac{1}{x}q = 4xs$
- $r - \frac{1}{x}q = 4x^2s$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$r - \frac{1}{x}p = 4x^2t$

4) **1 point**

If

$z = \frac{1}{x}\phi(y-x)+\phi'(y-x),$

then the PDE obtained by eliminating arbitrary functions ϕ *is given by*

- $r - t = \frac{2}{x^2}$
- $r - t = \frac{2z}{x}$
- $r - t = \frac{2z}{x^2}$
- $r - t = \frac{2z^2}{x^2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$r - t = \frac{2z}{x^2}$

5) *The canonical form of the PDE* **1 point**

$x^2r - y^2t = 0$

is given by

- $z_{uv} = 0$

$2uz_{uv} - z_v = 0$

$uz_{uv} - z_v = 0$

$uz_{uv} + z_v = 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$2uz_{uv} - z_v = 0$

6) $The\ canonical\ form\ of$ ***1 point***

$$y^2 r - 2xys + x^2 t = \frac{y^2}{x} p + \frac{x^2}{y} q$$

$is\ given\ by$

$z_{vv} = 0$

$z_{uv} = 0$

$z_{uu} = 0$

$z_{uu} - z_{vv} = z_{uv}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$z_{vv} = 0$

7) $The\ canonical\ form\ of$ ***1 point***

$$y^2 r + x^2 t = 0$$

$is\ given\ by$

$z_{\alpha\alpha} + z_{\beta\beta} + \frac{1}{2}(z_\alpha + z_\beta) = 0$

$z_{\alpha\alpha} + z_{\beta\beta} + \left(\frac{1}{\alpha} z_\alpha + \frac{1}{\beta} z_\beta\right) = 0$

$z_{\alpha\alpha} + z_{\beta\beta} + \frac{1}{2}\left(\frac{1}{\alpha} z_\alpha + \frac{1}{\beta} z_\beta\right) = 0$

$z_{\alpha\alpha} + z_{\beta\beta} = 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$z_{\alpha\alpha} + z_{\beta\beta} + \frac{1}{2}\left(\frac{1}{\alpha} z_\alpha + \frac{1}{\beta} z_\beta\right) = 0$

8) ***1 point***

$The\ general\ solution\ of\ the\ equation$
$(y-1)r-(y^2-1)s+y(y-1)t+p-q-2ye^{2x}(1-y)^3=0$
$after\ reducing\ to\ canonical\ form,\ is\ given\ by$

- $z=uv+\phi_1(u)+\phi_2(v)$
- $z=uv^2+\phi_1(u)$
- $z=uv^2+\phi_1(u)+\phi_2(v)$
- $z=uv+\phi_2(v)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$z=uv^2+\phi_1(u)+\phi_2(v)$

9) ***1 point***

$The\ characteristics\ of\ the\ PDE\ (\sin^2\ x)r+(2\cos\ x)s-t=0\ are\ given\ by$

- $y-\csc\ x+\cot\ x=c_1$
  $y+\csc\ x+\cot\ x=c_2$
- $y-\csc\ x+\cot\ x=c_1$
  $y-\csc\ x-\cot\ x=c_2$
- $y+\csc\ x-\cot\ x=c_1$
  $y+\csc\ x+\cot\ x=c_2$
- $y+\csc\ x-\cot\ x=c_1$
  $y-\csc\ x-\cot\ x=c_2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y+\csc\ x-\cot\ x=c_1$
$y+\csc\ x+\cot\ x=c_2$

10) $The\ characteristics\ of\ the\ PDE\ yr+(x+y)s+xt=0\ are\ given\ by$ ***1 point***

- $y+x=c_1$
  $y^2-x^2=c_2$
- $y-x=c_1$
  $y^2+x^2=c_2$
- $y+x=c_1$
  $y^2+x^2=c_2$
- $y-x=c_1$
  $y^2-x^2=c_2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y - x = c_1$
$y^2 - x^2 = c_2$

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