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C,

(Должно быть представлено в виде аннотации, разделы и темы которой согласуются с тематическим планом, объемом не более 1 стр.)

1		21	6	8	7
2		27	12	10	5
3		17	4	8	5
4		28	6	12	10
5		24	4	10	10
		27			27
		144	**32**	**48**	**37+27**

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grad R.
grad (R).
grad 1/R.

Задача для самостоятельного решения

grad( ).

grad

grad($\vec{a}\vec{R}$ $\vec{a} = const$ $\vec{R}$ -

Задача для самостоятельного решения

div grad

-

- $\vec{R}$ R

R.

$$\oint_S \left(rot\vec{A}\right)d\vec{S} = 0$$

Задача для самостоятельного решения

$\oint_S \vec{B}d\vec{S} = 0$ $\vec{B}$ -

- $div\left(rot\vec{A}\right) = 0.$

$$div\frac{\vec{P}}{R} = \frac{\vec{R}}{R}\frac{d}{dR}\left(\frac{\vec{P}}{R}\right) \qquad \vec{P} = \vec{P}(R).$$

Задача для самостоятельного решения

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$$x^2\frac{\partial^2 u}{\partial y \partial x} + 2x\frac{\partial u}{\partial y} = 0.$$

$\frac{\partial^2 u}{\partial t^2} = a^2\frac{\partial^2 u}{\partial x^2}$ u(0,t)=0,

u(l,t)=0; u(x,0)=f(x), $\frac{\partial u}{\partial x}(x,0) = 0$ $f(x) = \frac{2u_0 x}{l}$ x l/2, $f(x) = -\frac{2u_0 x}{l} + 2u_0$ l x l.

l

u(x,t

u(c,0)=h.

x=-l x=l

u(0,0)=h

u(x,t).

Задача для самостоятельного решения

$$\frac{\partial^2 u}{\partial t^2} = 9^2 \frac{\partial^2 u}{\partial x^2}$$ u(0,t)=u(2,t

$u(x,0) = \frac{1}{4}\sin\frac{3\pi x}{2}, \frac{\partial u}{\partial x}(x,0) = \sin \pi x.$

$\frac{\partial^2 u}{\partial t^2} = \frac{1}{4}\frac{\partial^2 u}{\partial x^2}; u(x,0) = \cos x, \frac{\partial u}{\partial t}(x,0) = x - 1.$

$u(x,0) =$

$\begin{cases} 1 - |x-1|, x \in (0,2) \\ 0, x \notin (0,2) \end{cases}$ $\frac{\partial^2 u}{\partial t^2} = 2\frac{\partial^2 u}{\partial x^2}$

t

$\frac{\partial^2 u}{\partial t^2} = \frac{\partial^2 u}{\partial x^2}$ $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$

Задача для самостоятельного решения

$\frac{\partial^2 u}{\partial t^2} = 4\frac{\partial^2 u}{\partial x^2}$ t>0, - x u(x,0)=0, $\frac{\partial u}{\partial x}(x,0) = \begin{cases} 1, x \in (0,2) \\ 0, x \notin (0,2) \end{cases}$

$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \frac{\partial^2}{\partial x^2} - \frac{\partial^2}{\partial y^2}\right) u(x,y,t) = 0$

u(0,0,t)=u(0,a,t)=u(b,0,t)=u(a,b,t)=0; u(x,y x,y); $\frac{\partial u}{\partial t}(x,y,0) = 0.$

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$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \Delta\right) u(x,y,z,t) = 0$

u(x,y,0,t)=u(x,0,z,t)=u(0,y,z,t)=u(x,b,z,t)=u(a,y,z,t)=u(x,y,0,t)=0; u(x,y,z x,y,z); $\frac{\partial u}{\partial t}(x,y,z,0) = 0$

10

$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2} + F(x,t)$

u(0,t)=u(l,t u(x x).

$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2}$ u(0,t)=0, u(l,t)=0, t>0; $u(x,0) = \begin{cases} x, 0 \le x \le l/2 \\ l - x, l/2 \le x \le l \end{cases}$

$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2} + 2x + 1$, 0<x<l, t>0; u(0,t)=l, u(1,t)=2, u(x,0)=x+1.

Задача для самостоятельного решения

$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ u(0,t)=0, u(1,t)=0; u(x,0)=u(1-x)

11

$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0.$

Задача для самостоятельного решения

$\frac{\partial u}{\partial t} = 13\frac{\partial^2 u}{\partial x^2}, u|_{t=0} = e^{-3x^2+2x}.$

2

$r^2 \frac{\partial^2 u}{\partial r^2} + r\frac{\partial u}{\partial r} + \frac{\partial^2 u}{\partial \varphi^2} = 0$ $u|_{r=R} = f(\varphi),$

f

Задача для самостоятельного решения

u r 3,

$$u|_{r=R} = \varphi^2 + 6\varphi + 1$$

13

$\frac{\partial^2 u}{\partial t^2} = a^2 \frac{\partial^2 u}{\partial x^2} + F(x,t)$ u(x x), u(0,t)=u(l,t)=0; $\frac{\partial u}{\partial x}(x,0) = \psi(x)$

Задача для самостоятельного решения

$\frac{\partial^2 u}{\partial t^2} = a^2 \frac{\partial^2 u}{\partial x^2} + 2x + 1$

u(0,t)=1, u(l,t)=0, u(x,0)=1-x/l; $\frac{\partial u}{\partial t}(x,0) = 0$

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a b m u(,)=2, u(a, u(b,)=cos( ).

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a b u(,)=0, u u(, /)=0, u(,)=3 -sin2 , u(b,)=0.

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$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$, u(0,y)=0, u(2,y)=0, u(x,0)=0, u(x,2)=sin x/2).

7

1) $3\frac{\partial^2 u}{\partial x^2} - 6\frac{\partial^2 u}{\partial x \partial y} + 3\frac{\partial^2 u}{\partial y^2} + 5\frac{\partial u}{\partial x} - 3\frac{\partial u}{\partial y} + 2u = y - x$
2) $\frac{\partial^2 u}{\partial x^2} - 6\frac{\partial^2 u}{\partial x \partial y} + 9\frac{\partial^2 u}{\partial y^2} + 5\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} - 3u = y$
3) $3\frac{\partial^2 u}{\partial x^2} - 4\frac{\partial^2 u}{\partial x \partial y} + \frac{\partial u}{\partial x} - 3\frac{\partial u}{\partial y} + u = 0$
4) $2\frac{\partial^2 u}{\partial x^2} + 6\frac{\partial^2 u}{\partial x \partial y} + 8\frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x} + 5\frac{\partial u}{\partial y} - 2u = y - 1{,}5x$

Задача для самостоятельного решения

1) $2\frac{\partial^2 u}{\partial x^2} - 4\frac{\partial^2 u}{\partial x \partial y} + 2\frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x} - 3\frac{\partial u}{\partial y} + u = y^2$
2) $\frac{\partial^2 u}{\partial x^2} - 2\frac{\partial^2 u}{\partial x \partial y} - 8\frac{\partial^2 u}{\partial y^2} + 3\frac{\partial u}{\partial y} - u = 0$
3) $3\frac{\partial^2 u}{\partial x^2} + 8\frac{\partial^2 u}{\partial x \partial y} + 6\frac{\partial^2 u}{\partial y^2} + 3\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} - 2 = \frac{\sqrt{2x}}{3}$

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$$\frac{\partial^2 u}{\partial x^2} + 4\frac{\partial^2 u}{\partial x \partial y} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} - x^2 y = 0$$

$x^2 \frac{\partial^2 u}{\partial x^2} - y^2 \frac{\partial^2 u}{\partial y^2} = 0$, x>0, y>0?

Задача для самостоятельного решения

$\frac{\partial^2 u}{\partial x^2} - 6\frac{\partial^2 u}{\partial x \partial y} + 10\frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x} - 3\frac{\partial u}{\partial y} = 0.$

$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \Delta_{r,\varphi}\right) u(r,\varphi,t) = 0$ u(R t)=0; u(R r); $\frac{\partial}{\partial t} u(R,\varphi,0) = 0.$

$$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \Delta_{r,\varphi} - \frac{\partial^2}{\partial z^2}\right)u(r,\varphi,z,t) = 0$$

u(R t)=u(R C,t)=0; u(r z r z); $\frac{\partial}{\partial t}u(r,\varphi,z,0) = 0$

$$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \Delta_{r,\theta,\varphi}\right)u(r,\theta,\varphi,t) = 0$$

u(R t)=0, u(r r); $\frac{\partial}{\partial t}u(r,\theta,\varphi,0) = 0$

$$\left(\frac{1}{\vartheta}\frac{\partial}{\partial t} - \frac{\partial^2}{\partial x^2}\right)T(x,t) = 0$$

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$$\left(\frac{1}{v^2}\frac{\partial^2}{\partial t^2} - \Delta\right)u = f(x,y,z,t)$$

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$$u_{xx} + 4u_{xy} + u_{yy} + u_x + u_y - x^2 y = 0$$

На экзамене

1.
2-
222 ISBN 978-5-534-03589-6.
URL: https://urait.ru/bcode/472356

2.
Maple 2-
302 ISBN 978-5-
534-05278-7. URL:

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1. https://www.lektorium.tv/lecture/15260 -
2. https://teach-in.ru/course/mathematical-physics-bogolubov/about - -

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