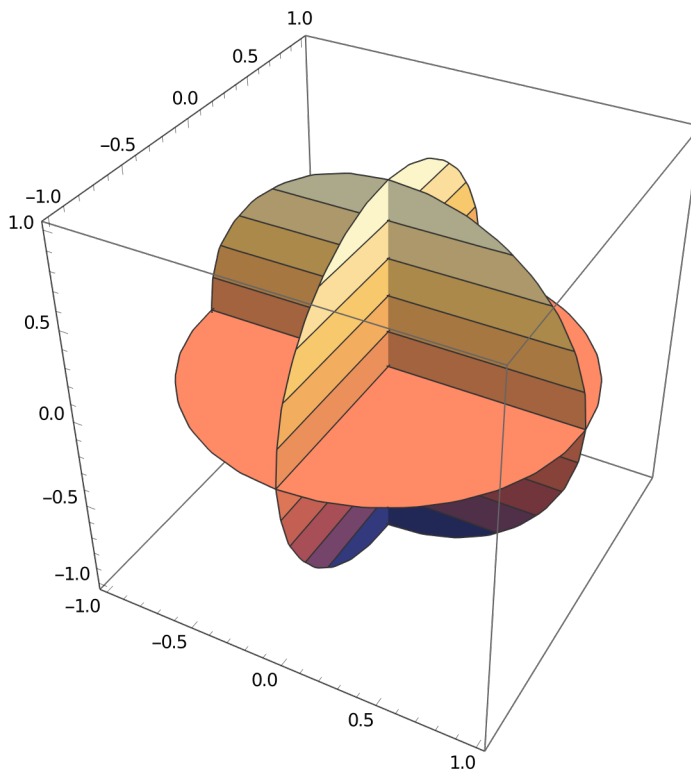**hat**

In[94]:= `deqn = -Laplacian[V[x, y, z], {x, y, z}] == 0;`
`region = Ball[{0, 0, 0}];`
`boundary = DirichletCondition[V[x, y, z] == z / Sqrt[(x^2 + y^2 + z^2)], True];`
`solution = NDSolveValue[{deqn, boundary}, V, {x, y, z} ∈ region]`
`SliceContourPlot3D[solution[x, y, z], "CenterPlanes", {x, y, z} ∈ region]`

Out[97]=

InterpolatingFunction[⊞ 〰 Domain: {{-1., 1.}, {-1., 1.}, {-1., 1.}}]
                              Output: scalar

Data not saved. Save now ⇥

Out[98]=

In[101]:=

```
(*
Function has no dependence on phi. setting phi → 0 for taking value:
*)
coords = CoordinateTransform[{"Spherical" → "Cartesian"}, {0.1, 0.3, 0}]
solution[0.029552020666133955, 0., 0.09553364891256061]
```

Out[101]=
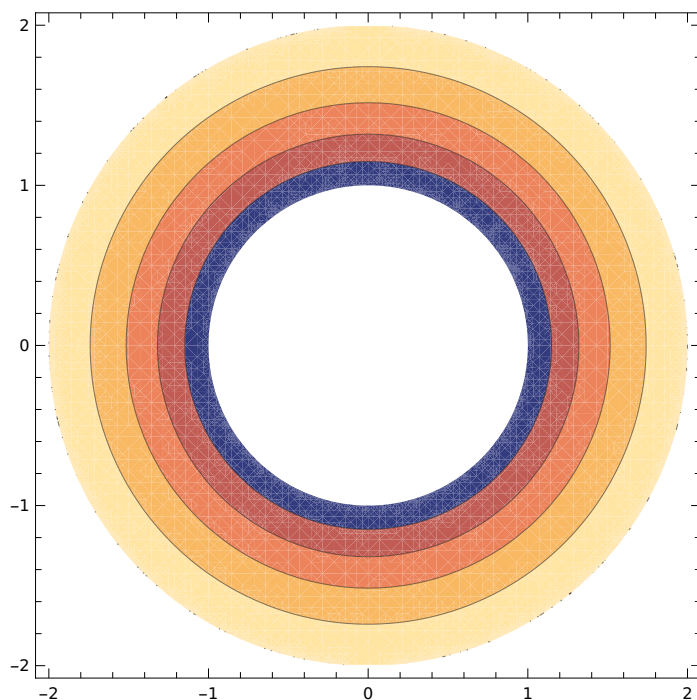
```
{0.029552, 0., 0.0955336}
```

Out[102]=

0.0959505

In[54]:=

```
deqn2 = -Laplacian[V[x, y], {x, y}] == 0 ;
region2 = Annulus[{0, 0}, {1, 2}];
boundary1 = DirichletCondition[V[x, y] == 0, Sqrt[x^2 + y^2] == 1];
boundary2 = DirichletCondition[V[x, y] == 1, Sqrt[x^2 + y^2] == 2];
solution = NDSolveValue[{deqn2, boundary1, boundary2}, V, {x, y} ∈ region2]
ContourPlot[solution[x, y], {x, y} ∈ region2, PlotRange → All]
```

Out[58]=

InterpolatingFunction[⊞ 〜 Domain: {{-2., 2.}, {-2., 2.}} Output: scalar]

Out[59]=

In[9]:= `v[x_] := Piecewise[{{x^2, -10 < x < 0}, {x, 0 ≤ x < 10}}]`

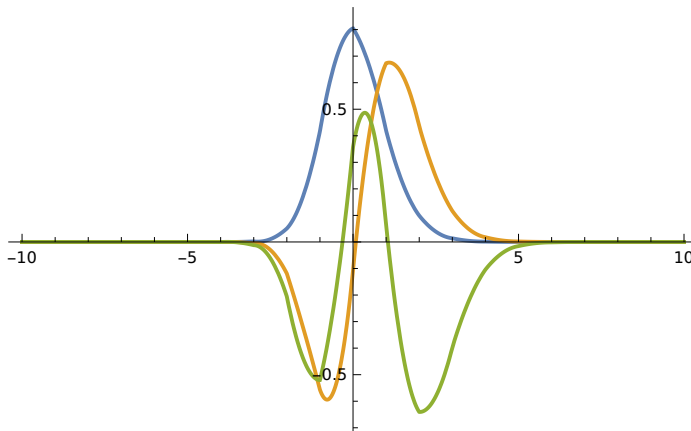`{eval, evec} = NDEigensystem[{-(1/2) Laplacian[ψ[x], {x}] + v[x] * ψ[x]}, ψ[x], {x, -10, 10}, 3]`

Out[10]=

{{0.762032, 1.95571, 2.92049}, {InterpolatingFunction[⊞ ⎍ Domain: {{-10., 10.}} Output: scalar][x],

InterpolatingFunction[⊞ ⎍ Domain: {{-10., 10.}} Output: scalar][x],

InterpolatingFunction[⊞ ⎍ Domain: {{-10., 10.}} Output: scalar][x]}}

In[17]:= `Plot[evec, {x, -10, 10}, PlotRange → Full]`

Out[17]=

In[41]:= `v[x_, y_] := x^2 + y^2`

`region3 = Disk[{0, 0}, 5]`

`boundary3 = DirichletCondition[v[x, y] == 0, Sqrt[x^2 + y^2] == 5]`

`{eval, evec} =`

`NDEigensystem[{-(1/2) Laplacian[ψ[x, y], {x, y}] + v[x, y] * ψ[x, y]}, ψ[x, y], {x, y} ∈ region3, 3]`

`ContourPlot[evec[[1]], {x, y} ∈ region3, PlotRange → All]`

`ContourPlot[evec[[2]], {x, y} ∈ region3, PlotRange → All]`

`ContourPlot[evec[[3]], {x, y} ∈ region3, PlotRange → All]`

Out[42]=

`Disk[{0, 0}, 5]`

Out[43]=

`DirichletCondition[x^2 + y^2 == 0, √(x^2 + y^2) == 5]`

Out[44]=

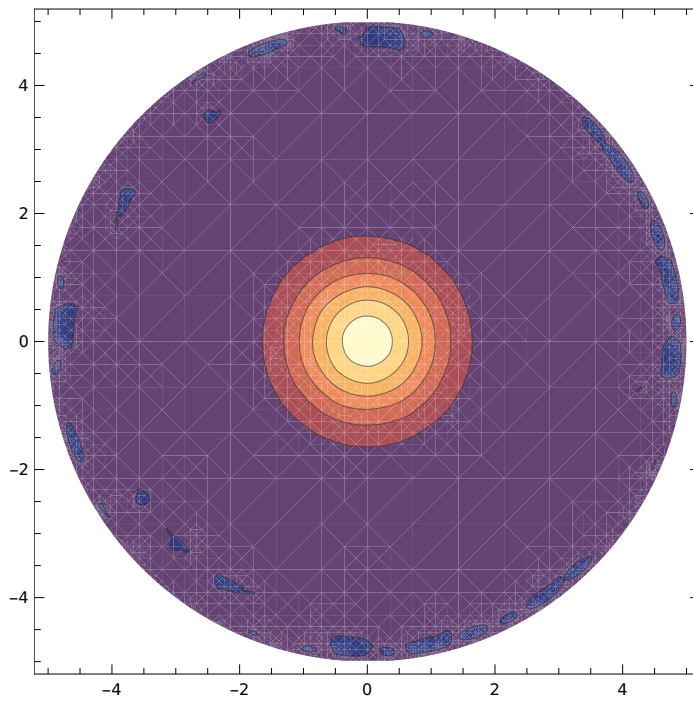$\{\{1.41553, 2.83333, 2.83397\}, \{$InterpolatingFunction[⊞ 〰 Domain: {{−5., 5.}, {−5., 5.}} Output: scalar][x, y],
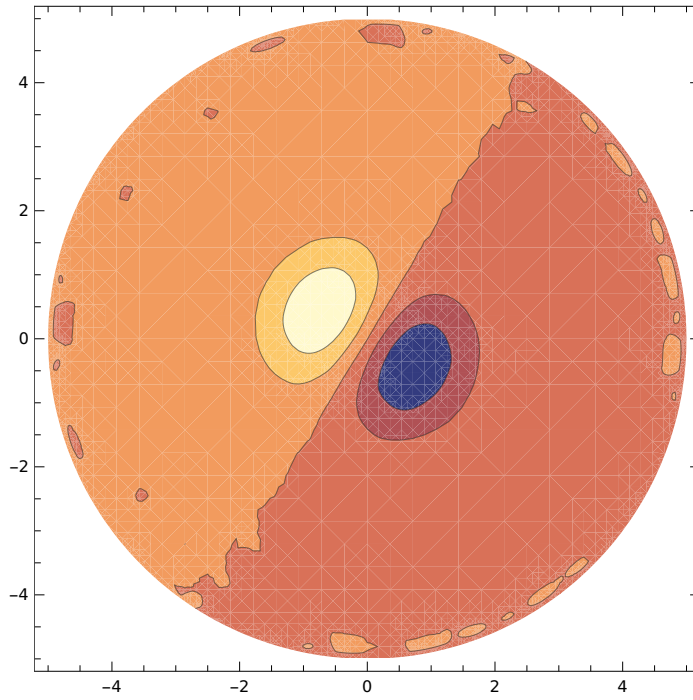
InterpolatingFunction[⊞ 〰 Domain: {{−5., 5.}, {−5., 5.}} Output: scalar][x, y],

InterpolatingFunction[⊞ 〰 Domain: {{−5., 5.}, {−5., 5.}} Output: scalar][x, y]$\}\}$

Out[45]=

Out[46]=

Out[47]=