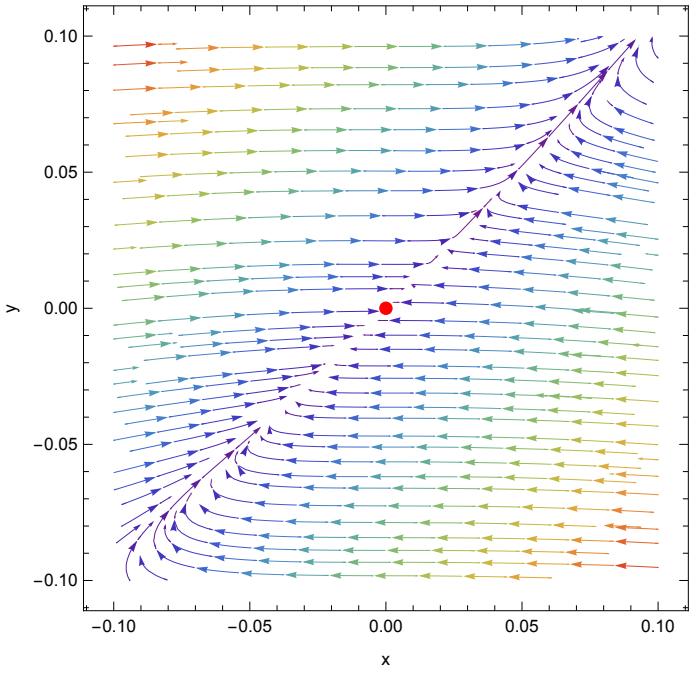
Problem set 3.1

In[20]:=

```
StreamPlot[{y - x, x^2}, {x, -0.1, 0.1}, {y, -0.1, 0.1},
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["Fixed-Point", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]
```

Out[20]=

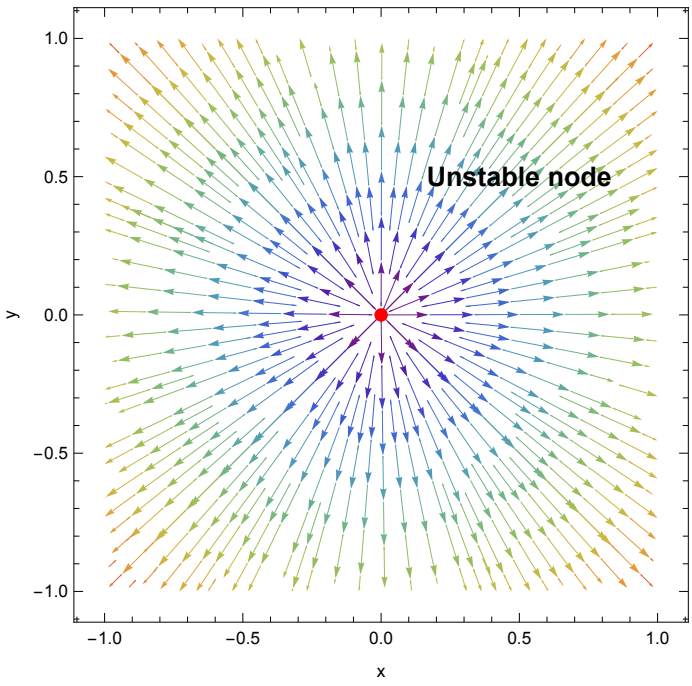


In[12]:=
```
a = 1
StreamPlot[{a*x, a*y}, {x, -1, 1}, {y, -1, 1},
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["Unstable node", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]

a = -1
StreamPlot[{a*x, a*y}, {x, -1, 1}, {y, -1, 1},
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["Stable-node", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]
```

Out[12]=
```
1
```

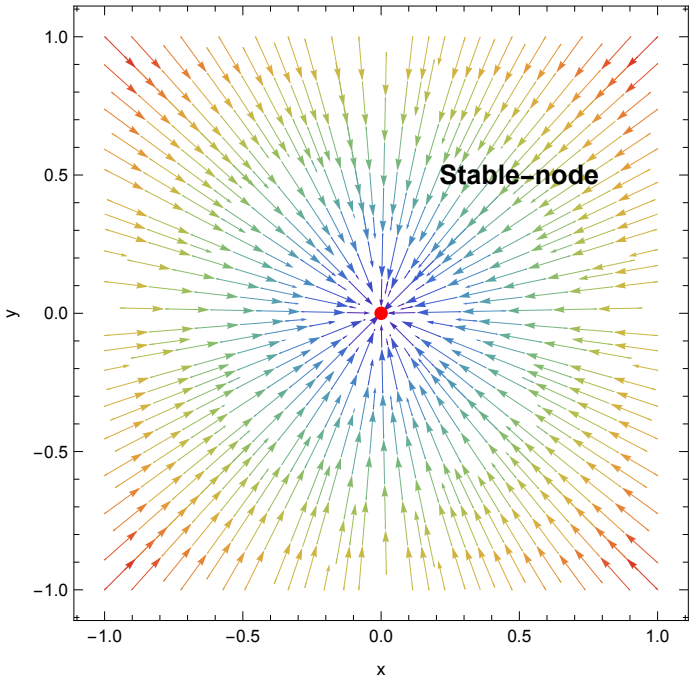
Out[13]=



Out[14]=

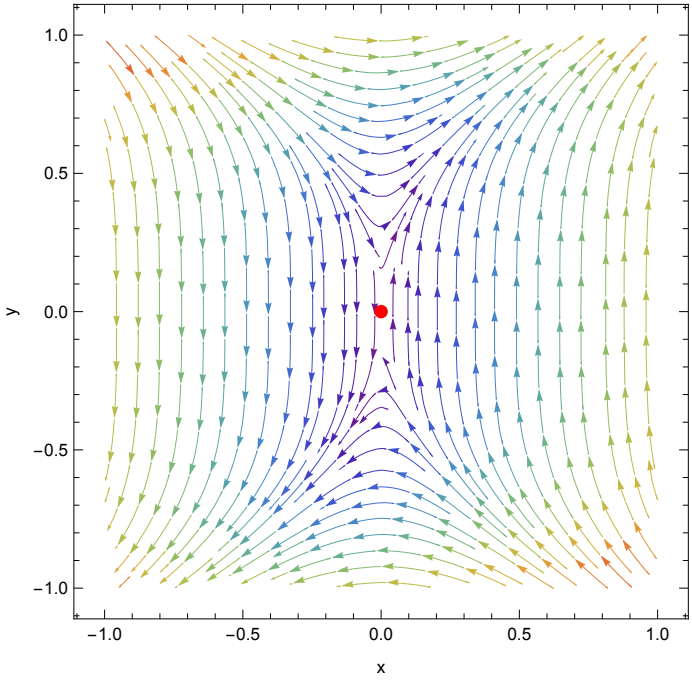
$$-1$$

Out[15]=



In[18]:=
```
StreamPlot[{y^3, x}, {x, -1, 1}, {y, -1, 1},
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]
```

Out[18]=

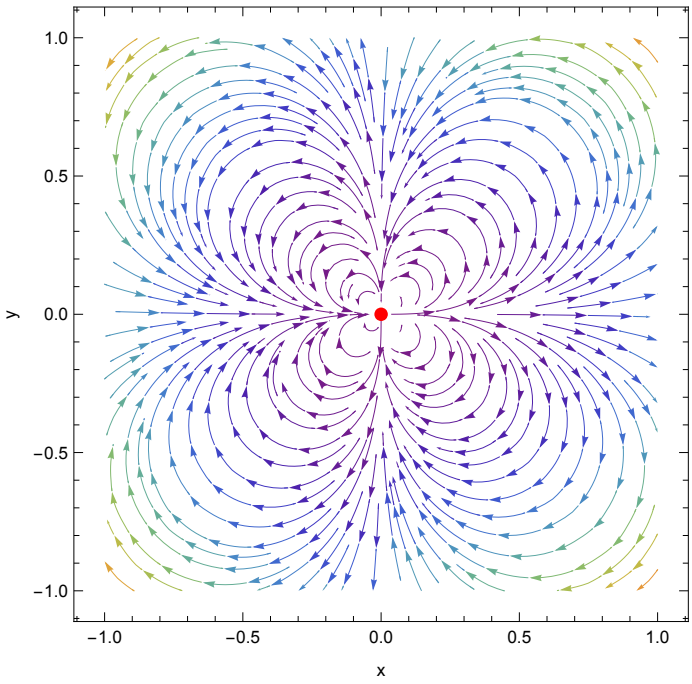


In[35]:=
```
n = 3
StreamPlot[{(y^2+x^2)^(Abs[n]/2)*Cos[n*ArcTan[y/x]], (y^2+x^2)^(Abs[n]/2)*Sin[n*ArcTan
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]
n = -3
StreamPlot[{(y^2+x^2)^(Abs[n]/2)*Cos[n*ArcTan[y/x]], (y^2+x^2)^(Abs[n]/2)*Sin[n*ArcTan
    StreamStyle → Automatic,
    StreamColorFunction → "Rainbow",
    FrameLabel → {"x", "y"},
    StreamPoints → Fine,
    Epilog → {
    Red, PointSize[Large], Point[{0, 0}],
    Black,
    Text[Style["", 14, Bold], {0.5, 0.5}]
    },
    AspectRatio → 1]
```

Out[35]=

3

Out[36]=



Out[37]=

−3

Out[38]=