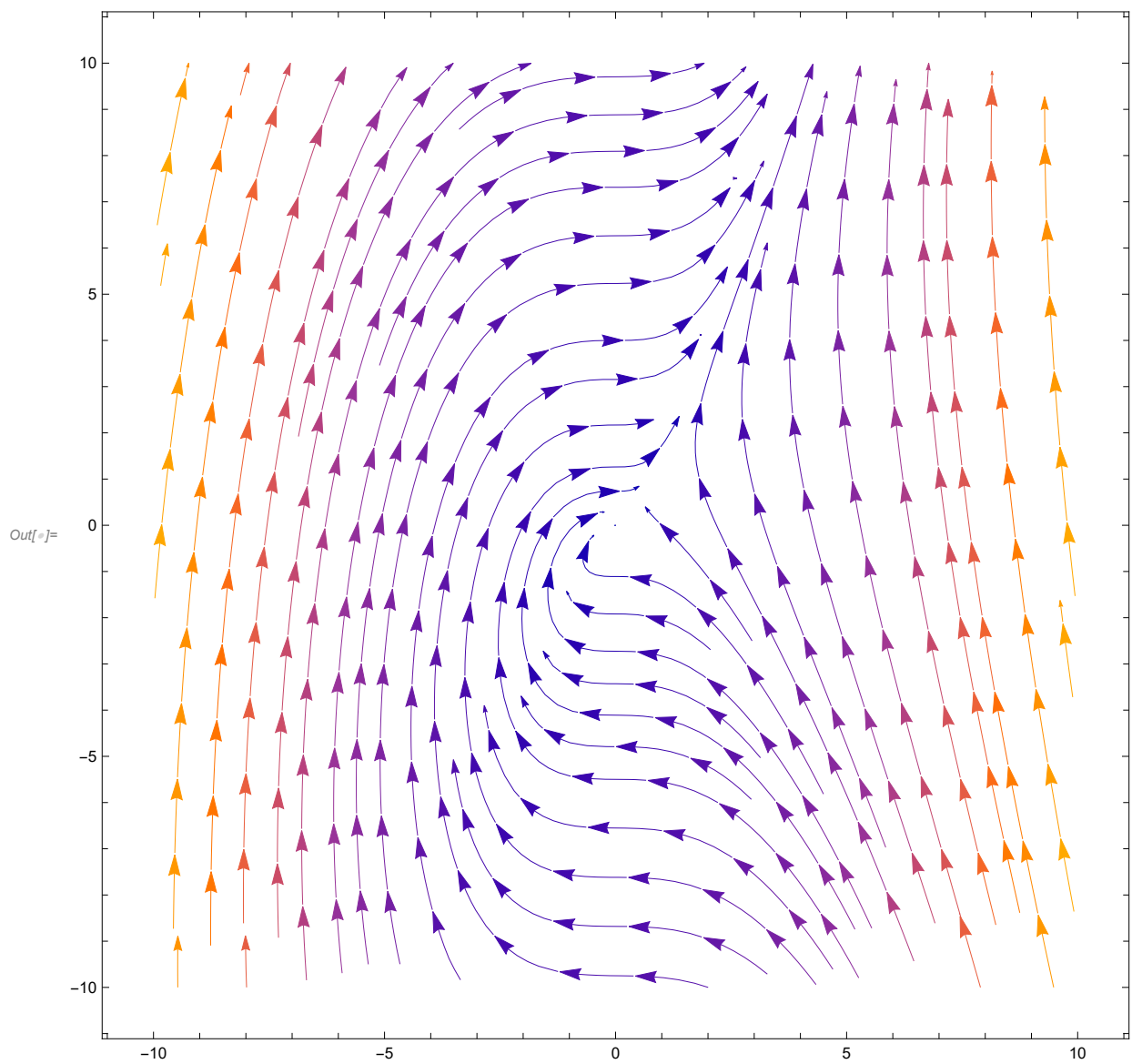
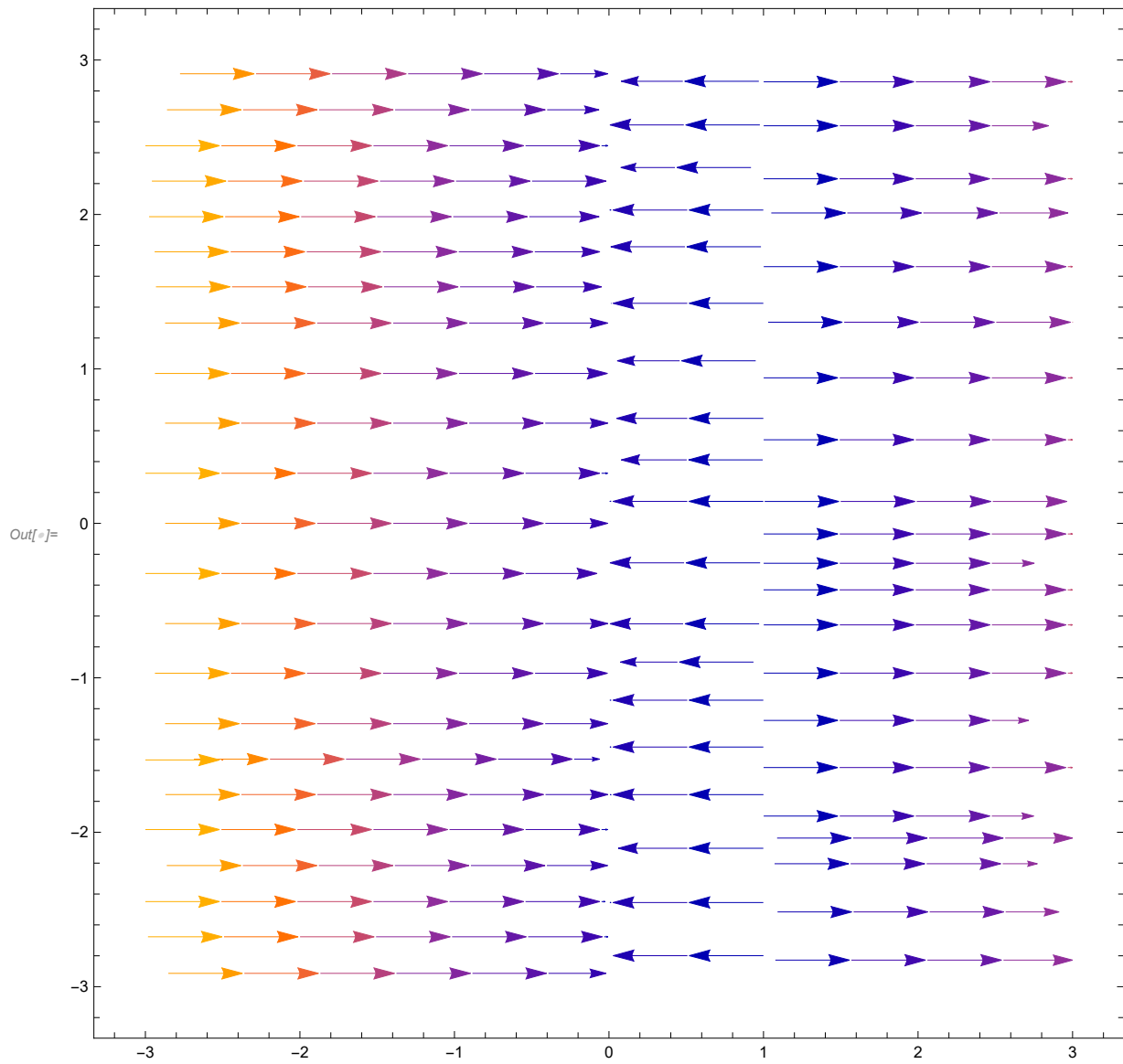


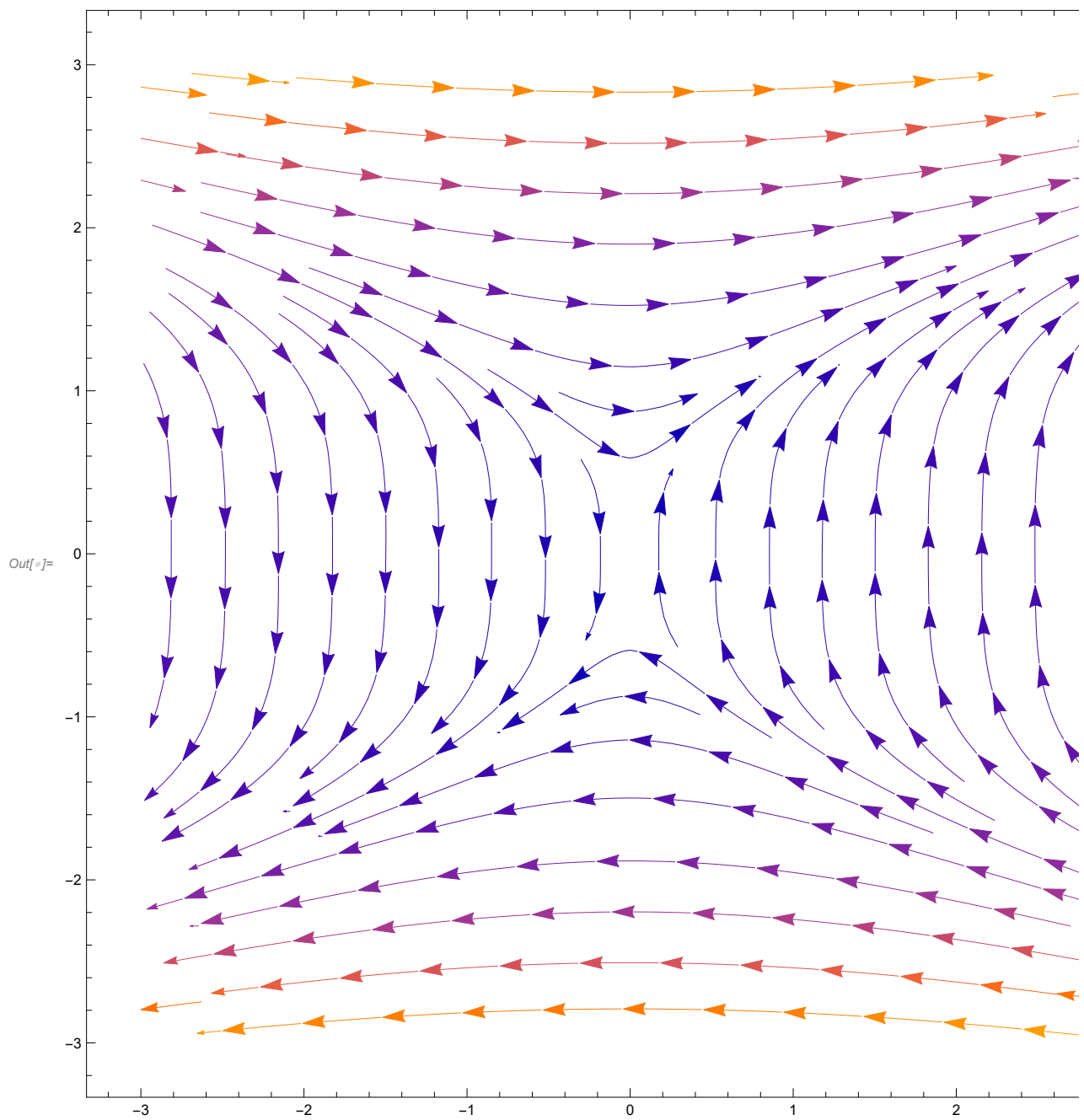
`StreamPlot[{y - x, x^2}, {x, -10, 10}, {y, -10, 10}]`



In[ ]:= StreamPlot[{a \* r + r^2, 0} /. {a → -1}, {r, -3, 3}, {θ, -3, 3}]



In[ ]:= StreamPlot[{y^3, x}, {x, -3, 3}, {y, -3, 3}]



```

In[1]:= Clear["Global`*"]
n = .;
f[x_, y_] := (x^2 + y^2)^(Abs[n] / 2) * Cos[n * ArcTan[y / x]];
g[x_, y_] := (x^2 + y^2)^(Abs[n] / 2) * Sin[n * ArcTan[y / x]];
r[x_, y_] := Sqrt[f[x, y]^2 + g[x, y]^2]
drx = Integrate[D[r[x, y], x], x];
dry = Integrate[D[r[x, y], y], y];
dr[x_, y_] := drx + dry
dr[x, y]
φ[x_, y_] := ArcTan[y / x];
I1 = Integrate[(f[x, y] * D[g[x, y], x] - g[x, y] * D[f[x, y], x]) / f[x, y]^2, x];
I2 = Integrate[(f[x, y] * D[g[x, y], y] - g[x, y] * D[f[x, y], y]) / f[x, y]^2, y];
dφ[x_, y_] := 1 / (1 + (g[x, y] / f[x, y])^2) * (I1 + I2)
dφ[x, y]
index = (Integrate[dφ[1, y], {y, -1, 1}] + Integrate[dφ[x, 1], {x, 1, -1}] +
  Integrate[dφ[-1, y], {y, 1, -1}] + Integrate[dφ[x, -1], {x, -1, 1}]) / (2 * Pi)
StreamPlot[{f[x, y], g[x, y]} /. n → -1, {x, -3, 3}, {y, -3, 3}]
StreamPlot[{dr[x, y], dφ[x, y]} /. n → 1, {x, -3, 3}, {y, -3, 3}]

```

Out[9]=  $2 \sqrt{(x^2 + y^2)^{\text{Abs}[n]}}$

Out[14]= 
$$\frac{2 \tan\left[n \operatorname{ArcTan}\left[\frac{y}{x}\right]\right]}{1 + \tan\left[n \operatorname{ArcTan}\left[\frac{y}{x}\right]\right]^2}$$

Out[15]= 0

