Stresses around an edge dislocation

Maple solution from Airy stress function

```
> Phi:=(1/2)*y*ln(x^2+y^2);
```

$$\Phi := \frac{1}{2}\,y\,\ln(x^2 + y^2)$$

Obtain stresses by differentiation

```
> sigma[x]:=simplify(diff(Phi,y,y));
```

$$\sigma_x := \frac{y\,(3\,x^2 + y^2)}{(x^2 + y^2)^2}$$

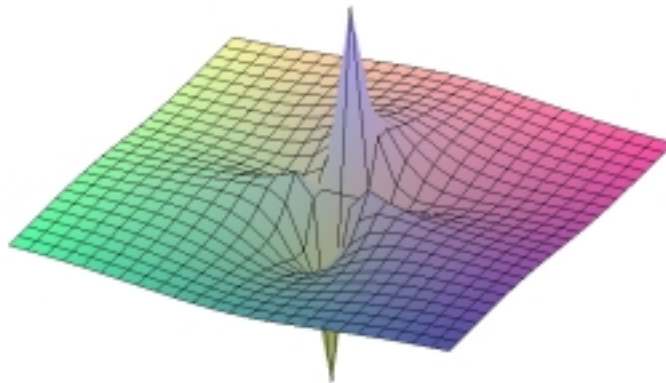```
> sigma[y]:=simplify(diff(Phi,x,x));
```

$$\sigma_y := \frac{y\,(-x^2 + y^2)}{(x^2 + y^2)^2}$$

```
> tau[xy]:=simplify(diff(Phi,x,y));
```

$$\tau_{xy} := -\frac{x\,(-x^2 + y^2)}{(x^2 + y^2)^2}$$

Plot of shear stress:

```
> plot3d(tau[xy],x=-1..1,y=-1..1);
```

3.11 Mechanics of Materials
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