ModSim Vorlesung MFB420, Prof. Wallrapp, HM

Übung 7a

```
hdot = 1/ρ/A(mzdot - ρ*AL*Sqrt[2*g*h])
```

$$\frac{\text{mzdot} - \sqrt{2}\ \text{AL}\ \sqrt{\text{g h}}\ \rho}{\text{A}\ \rho}$$

```
dhdotdA = D[hdot, A]
```

$$-\frac{\text{mzdot} - \sqrt{2}\ \text{AL}\ \sqrt{\text{g h}}\ \rho}{\text{A}^2\ \rho}$$

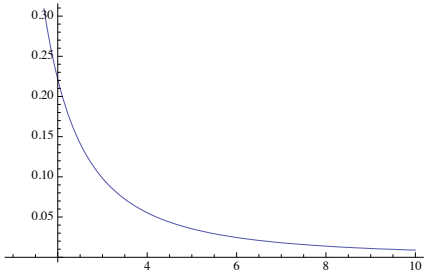
```
par = {mzdot → 1, AL -> 0.2, g → 9.81, h → 1, ρ → 1000}
```

$$\{\text{mzdot} \to 1,\ \text{AL} \to 0.2,\ \text{g} \to 9.81,\ \text{h} \to 1,\ \rho \to 1000\}$$

```
dhdotdA /. par
```

$$\frac{0.884889}{\text{A}^2}$$

```
Plot[dhdotdA /. par, {A, 1, 10}]
```



Übung 7b

```
dhdotdρ = D[hdot, ρ]
```

$$-\frac{\sqrt{2}\ \text{AL}\ \sqrt{\text{g h}}}{\text{A}\ \rho} - \frac{\text{mzdot} - \sqrt{2}\ \text{AL}\ \sqrt{\text{g h}}\ \rho}{\text{A}\ \rho^2}$$

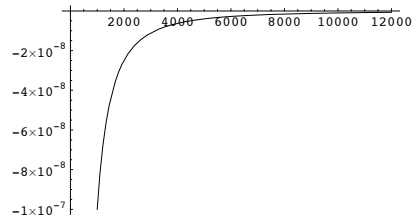
```
dhdotdρ = Simplify[dhdotdρ]
```

$$-\frac{\text{mzdot}}{\text{A}\ \rho^2}$$

```
par = {mzdot → 1, AL -> 0.2, g → 9.81, h → 1, A → 10}
```

$$\{\text{mzdot} \to 1,\ \text{AL} \to 0.2,\ \text{g} \to 9.81,\ \text{h} \to 1,\ \text{A} \to 10\}$$

```
dhdotdρ /. par
```

$$-\frac{1}{10\ \rho^2}$$

```
Plot[dhdotdρ /. par, {ρ, 1000, 12000}]
```