

HD-mirni-i-siloviti-tok

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Energija presjeka E_s

```
def Es(B, Q, y): return y + Q^2 / (2 * 9.81 * B^2 * y^2)
```

Kritična dubina y_c

```
def yc(B, Q): return (Q^2 / (9.81 * B^2))^(1/3)
```

```
yc(0.4, 0.2)
```

```
0.294277461066803
```

Kritična energija E_c

```
def Ec(B, Q): return Es(B, Q, yc(B, Q))
```

```
Ec(0.4, 0.2)
```

```
0.441416191600204
```

Asimptota za $y \gg y_c$

```
def A1(y): return y
```

Asimptota za $y \ll y_c$

```
def A2(B, Q, y): return Q^2 / (2 * 9.81 * B^2 * y^2)
```

```
y = var('y')
```

```
plotA1 = plot(A1(y), (y, 0.0, 1.5), color = 'green', legend_label = 'asimptota za $y \gg y_c$', linestyle = '--')
```

```
plotA2 = plot(A2(0.4, 0.2, y), (y, 0.0, 1.5), color = 'brown', legend_label = 'asimptota za $y \ll y_c$', linestyle = '--')
```

```
plotEs = plot(Es(0.4, 0.2, y), (y, 0.0, 1.5), legend_label = 'energija presjeka $E_s$')
```

```
pointEc = point((yc(0.4, 0.2), Es(0.4, 0.2, yc(0.4, 0.2))), color = 'red', pointsize = 20)
```

```
textEc = text('$E_c$', (0.3, 0.47), color = 'red')
```

```
show(plotA1 + plotA2 + plotEs + pointEc + textEc, aspect_ratio = 1, xmax = 1.5, ymax = 1.2, axes_labels = ('$y$', '$E_S(y)$'))
```

