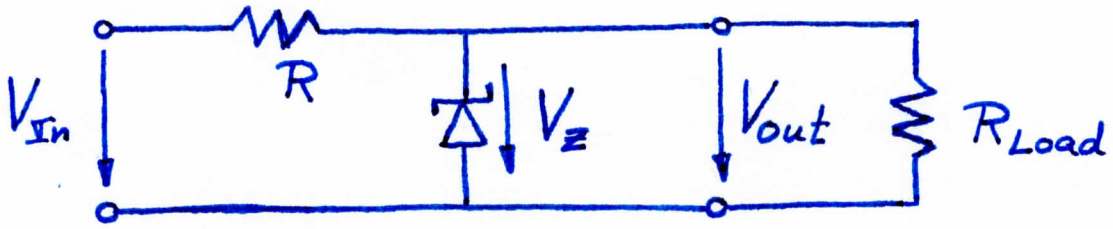
Zener diode applications

Voltage stabilization

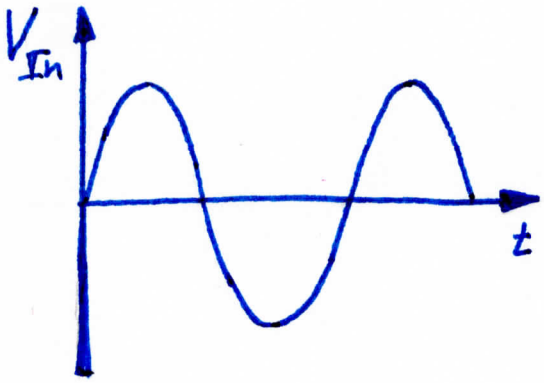


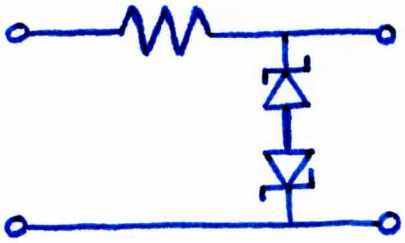
$\Rightarrow$ $V_{out} = V_z = \text{constant}$

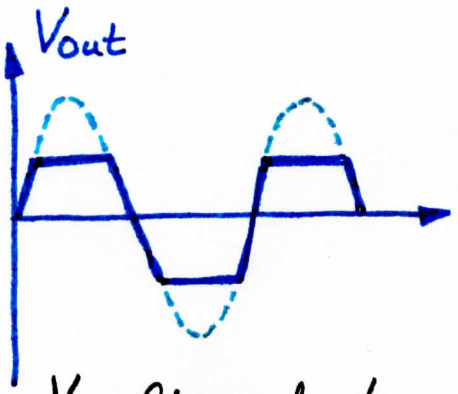
$\Rightarrow$ Circuit consumes power even if $R_{Load} = \infty$

$\Rightarrow$ R_{Load} cannot be arbitrarily small. For example, if $R_{Load} = 0$, then $V_{out} = 0$.

Voltage clipper



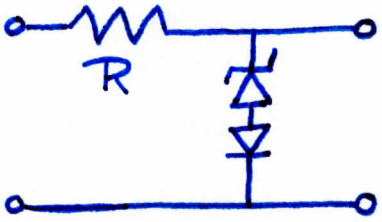


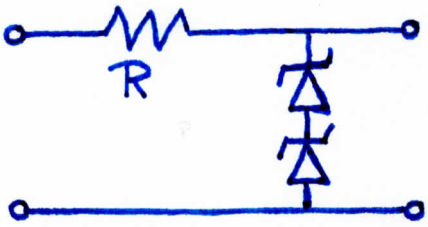


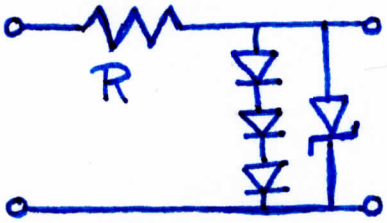
V clipped at
$V_z + V_{th} = V_z + 0.7V$

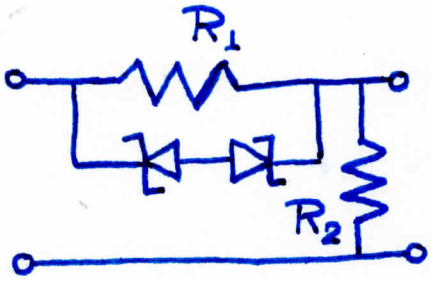
Input voltage must be greater than V_z.

How about the following circuits ?

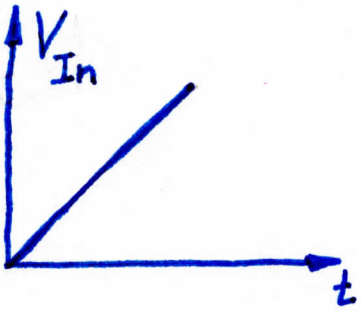


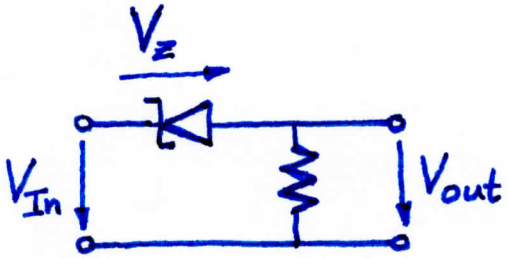


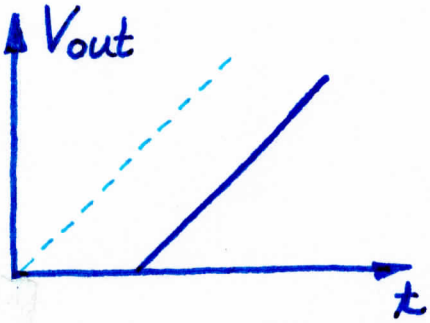




Voltage shifter







$V_{In} = \alpha t$

$V_{out} = \alpha t - V_z$