```
(* Lineare DGL 2. Ordnung mit konstanten Koeffizienten *)

(* die homogene DGL  :  *)

(* Bspl. für den 1.Fall:   D > 0 *)


dgl = y''[t] + 3 y'[t] +  y[t] == 0


(*    AWP:  y[0]==1, y'[0]==0    *)

Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]
```
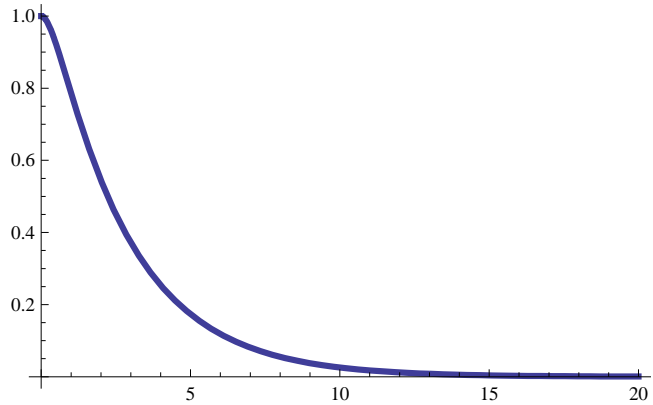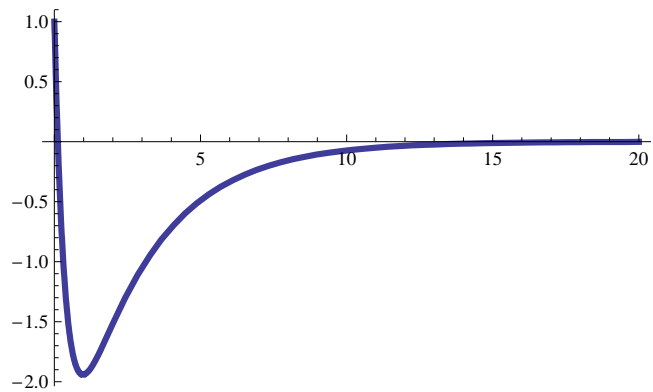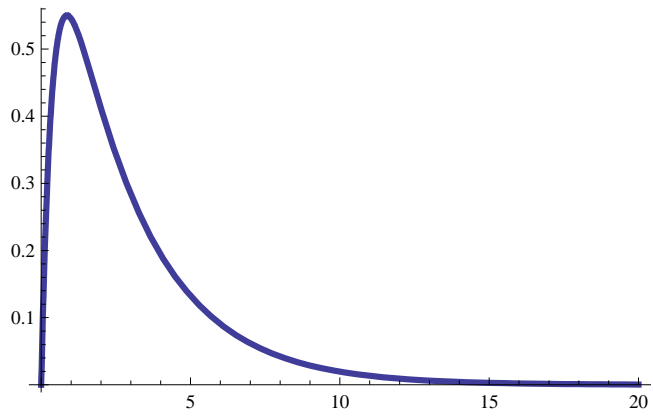


```
(*    AWP:  y[0]==1, y'[0]==-10 *)

Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]
```



```
(*    AWP: y[0]==0, y'[0]==2   *)
```

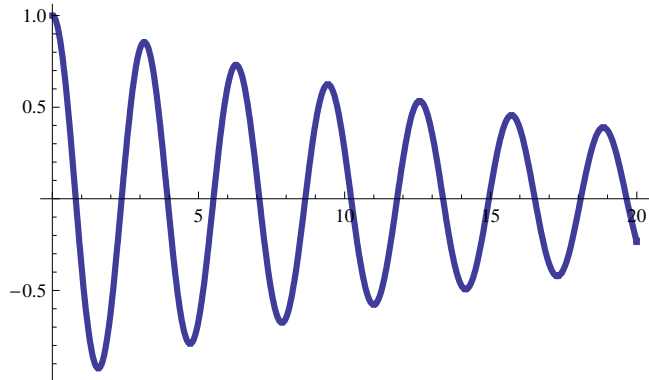**Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}]**
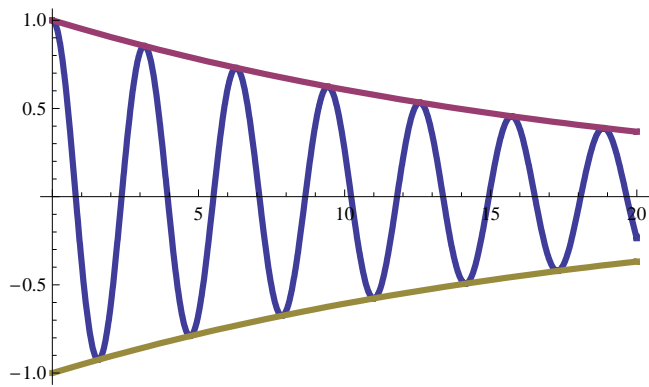
```
(* Bspl. für   D < 0 *)

dgl = y''[t] + 1 / 10 y'[t] +  4 y[t] == 0


(*    AWP: y[0]==1, y'[0]==0   *)

Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]
```



```
Plot[{yawp[t], e^{-t/20}, -e^{-t/20}}, {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]
```
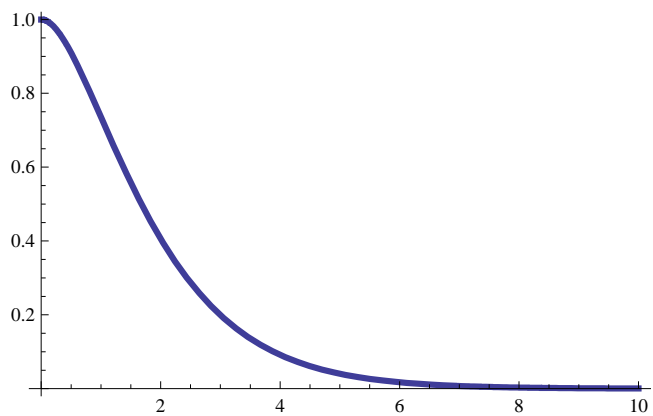
```
(* Bspl. für   D = 0 *)

dgl = y''[t] + 2 y'[t] +  y[t] == 0


(*    AWP: y[0]==1, y'[0]==0   *)

Plot[yawp[t], {t, 0, 10}, PlotStyle -> {Thickness[0.01]}]
```
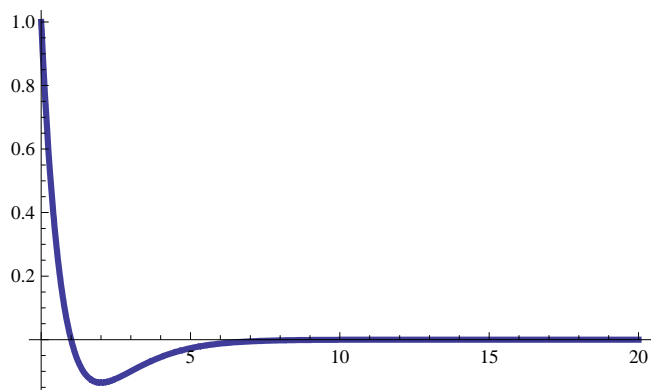


```
(*    AWP: y[0]==1, y'[0]==-2   *)

Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]
```
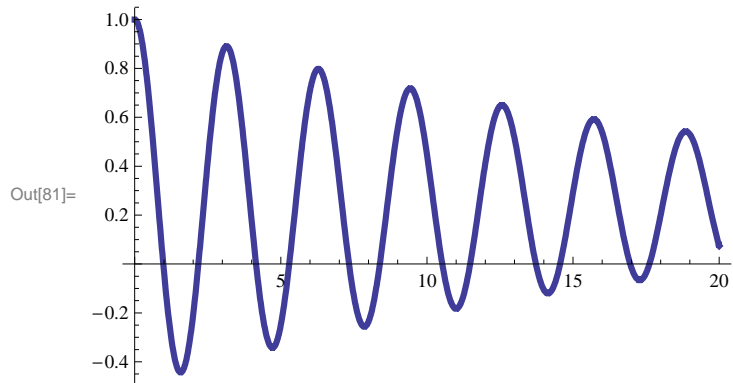
(* Bspl. für die inhomogene DGL mit unterkritischer Dämpfung, also D < 0 *)
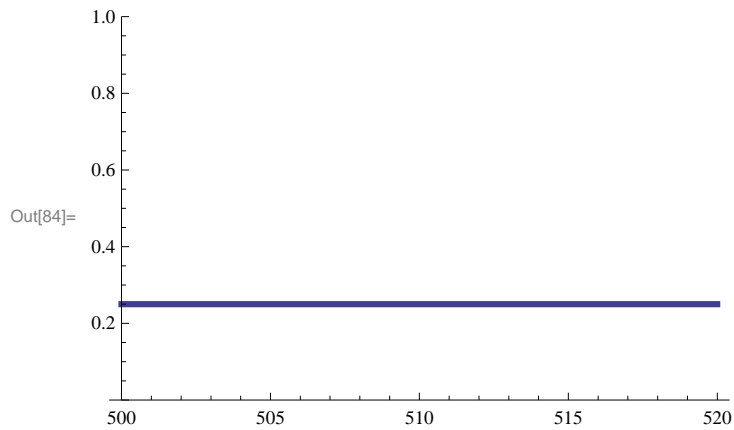
In[44]:= (* A: konstante Störung *)

In[74]:= `dgl = y''[t] + 1 / 10 y'[t] + 4 y[t] == 1`

(*   AWP: y[0]==1, y'[0]==0 *)

In[81]:= `Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]`

Out[81]=

In[84]:= `Plot[yawp[t], {t, 500, 520}, PlotStyle -> {Thickness[0.01]}, PlotRange → {0, 1}]`
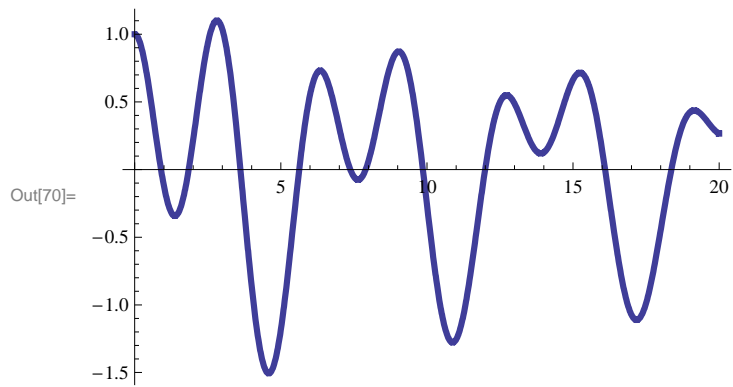
Out[84]=

(* B: perodische Anregung *)

In[60]:= **dgl = y''[t] + 1 / 10 y'[t] + 4 y[t] == 2 Sin[t]**

(*   AWP: y[0]==1, y'[0]==0 *)

In[70]:= **Plot[yawp[t], {t, 0, 20}, PlotStyle -> {Thickness[0.01]}, PlotRange → All]**

Out[70]=

In[71]:= **Plot[yawp[t], {t, 500, 520}, PlotStyle -> {Thickness[0.01]}, PlotRange → All (*{0,1}*)]**

Out[71]=