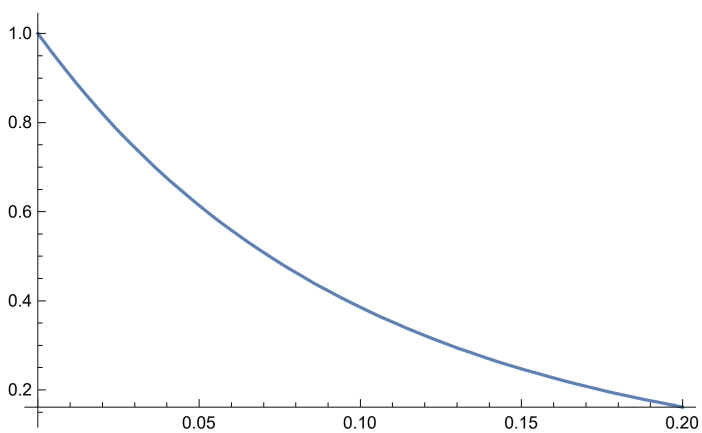
In[263]:=
```
(*  Using a Taylor series to approximate f[x] = (1/((1+x)^T)) the function
   for the annual zero coupon bond about the fixed point a =.05 with T = 10  *)

f[x_] := (1 / ((1 + x) ^10))
f[.05]
Plot[f[x], {x, 0, .2}]
(*  Evaluate the Derivatives  and plot the Taylor series*)
g[x] = D[f[x], x]
D[f[x], x] /. x → .05
Plot[g[x], {x, .01, .2}]
Plot[{{ f[.05] + (-5.85 * (x - .05))}, f[x]}, {x, .01, .2}]
k[x] = D[f[x], {x, 2}]
D[f[x], {x, 2}] /. x → .05
Plot[{{f[.05] + (-5.85 * (x - .05)) + (.5 (61.25) * ((x - .05) ^2))}, f[x]}, {x, .01, .2}]
w[x]  = D[f[x], {x, 3}]
D[f[x], {x, 3}] /. x → .05
Plot[{{f[.05] - (5.85 * (x - .05)) + (.5 (61.25) * ((x - .05) ^2)) - ((700 / 6) * ((x - .05) ^3))},
  f[x]}, {x, .01, .2}]
(* Plot the first, second and third order approximations *)
```

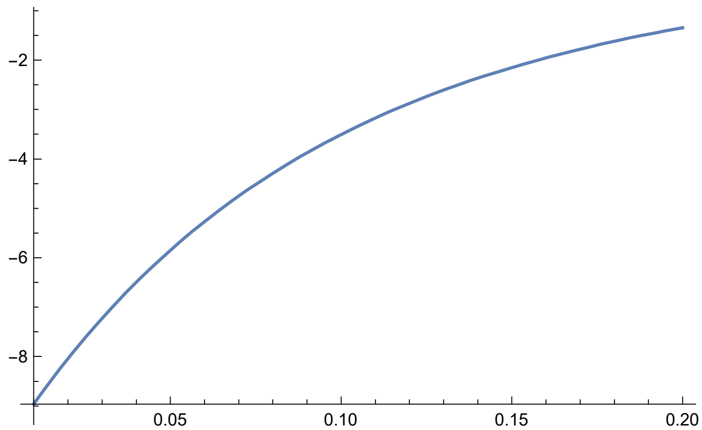
Out[264]= 0.613913

Out[265]=


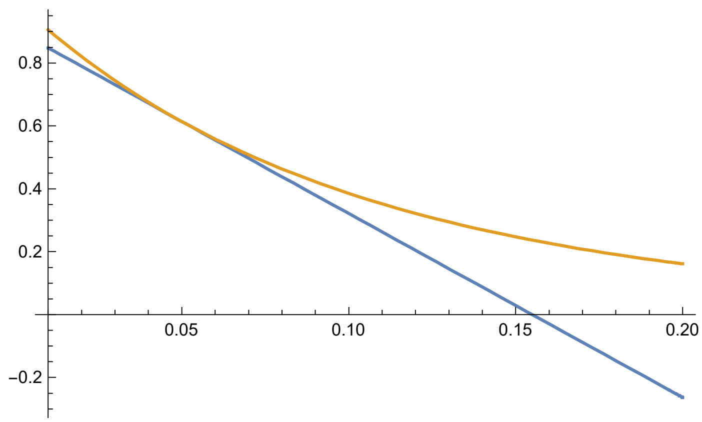
Out[266]= $-\frac{10}{(1+x)^{11}}$

Out[267]= -5.84679

Out[268]=



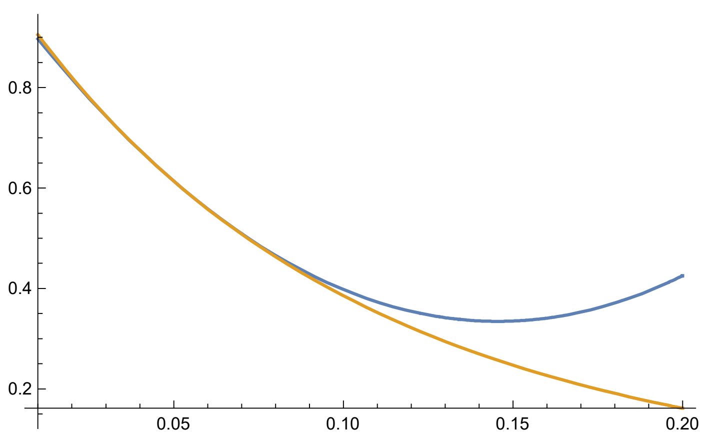
Out[269]=



Out[270]= $\frac{110}{(1+x)^{12}}$

Out[271]= 61.2521

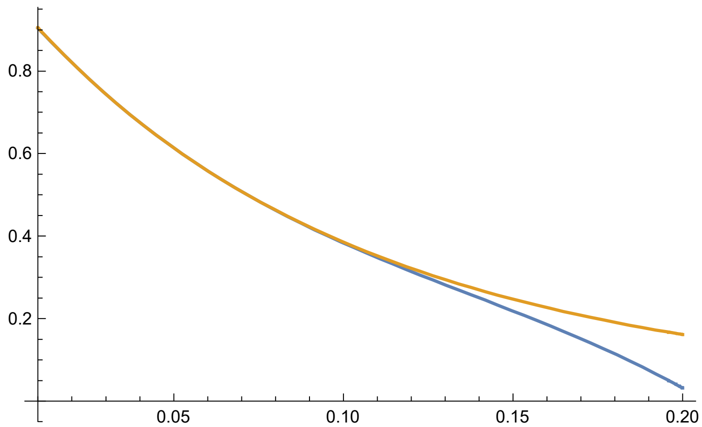
Out[272]=



Out[273]= $-\frac{1320}{(1+x)^{13}}$

Out[274]= -700.024

Out[275]=



In[276]:=