

```
Exit[]
```

```
$Assumptions =  $\mu > 0 \ \&\& \ \sigma > 0 \ \&\& \ a \in \text{Reals} \ \&\& \ 1 > k1 \geq 0 \ \&\& \ k0 \geq 0 \ \&\& \ S0 > 0 \ \&\& \ K > 0 \ \&\& \ r \geq 0 \ \&\& \ b \in \text{Reals} \ \&\& \ rf \geq 0 \ \&\& \ \gamma > 0;$ 
```

```
ost ==  $\sigma \sqrt{t}$ ; mpr ==  $\frac{\mu - r}{\sigma^2}$ ;
```

```
xx[W_, mpr_, ost_] := Exp[ost W];
```

```
 $\Delta[k_] := 1/2 \left( 1 + \text{Erf} \left[ \frac{-\text{Log}[k] + \text{ost}^2/2}{\text{ost}} \right] \right) - 1 // N$ 
```

```
 $\Delta[0.] = 0;$ 
```

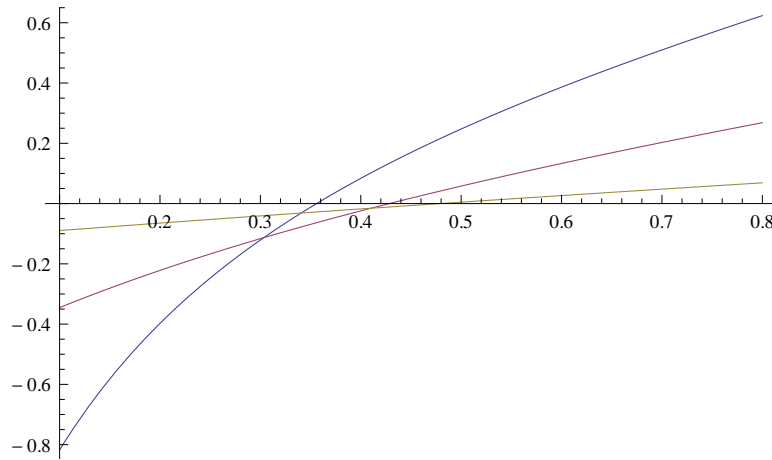
```
 $\gamma = .1$ ; mpr = 0.1; ost = .001;
```

```
g[a_, t_] := NIntegrate[Exp[-a (Exp[t w] - 1) - w^2/2], {w, - $\infty$ ,  $\infty$ }];
```

```
gs[a_, t_] := NIntegrate[Exp[-a (Exp[t w] - 1) - w^2/2] (1 - Exp[t w]), {w, - $\infty$ ,  $\infty$ }];
```

```
 $-6.59695 \times 10^{-13}$ 
```

```
Plot[{gs[a, 1], gs[a, .6], gs[a, .3]}, {a, .1, .8}]
```



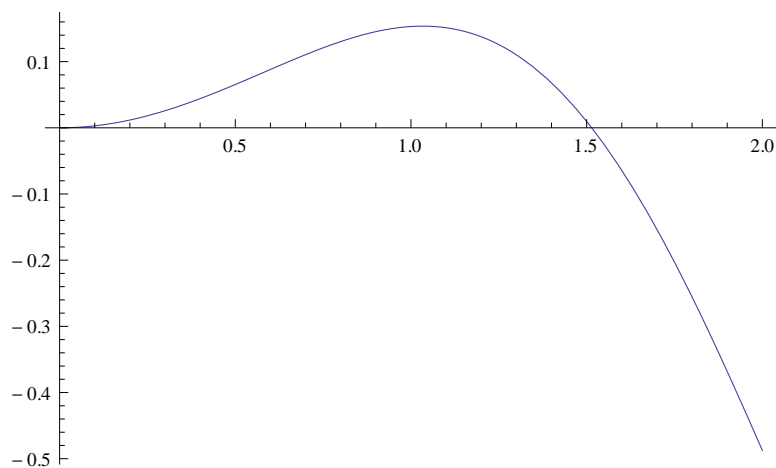
```
gs2[a_, t_] := NIntegrate[Exp[-a (Exp[-t w] - 1) - w^2/2] (1 - Exp[-t w]) +  
Exp[-a (Exp[t w] - 1) - w^2/2] (1 - Exp[t w]), {w, 0,  $\infty$ }];
```

```
Integrate[Exp[t w - w^2/2], {w, - $\infty$ ,  $\infty$ }]
```

```
 $e^{\frac{t^2}{2}} \sqrt{2 \pi}$ 
```

```
h[w_] := Exp[-a (Exp[w] - 1)] (Exp[w] - 1)
```

```
a = .7 / 2; Plot[h[x] + h[-x] /. x → w, {w, 0, 2}, PlotRange → All]
```



```
ie[s_, a_] := (a (s - 1) - 1) + (2 a - a^2 (s - 1)) s
```

```
a /. Solve[0 == ie[s, a], a]
```

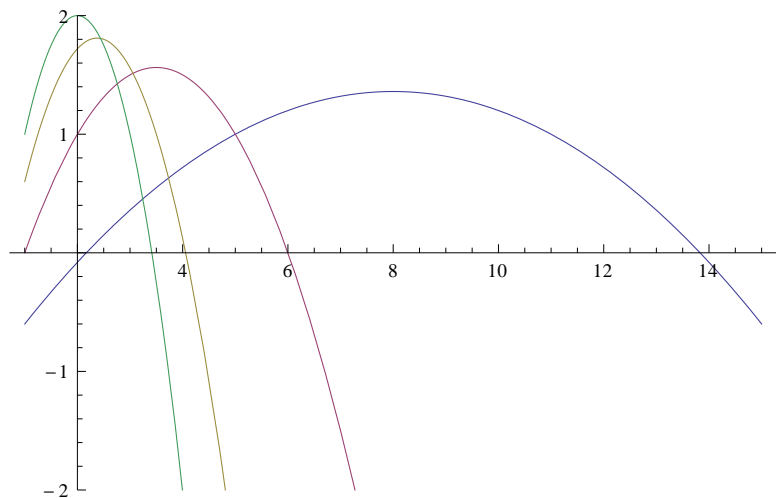
```
Limit[#, {s → 1}] & /@ %
```

$$\left\{ \frac{-1 + 3s - \sqrt{1 - 2s + 5s^2}}{2(-s + s^2)}, \frac{-1 + 3s + \sqrt{1 - 2s + 5s^2}}{2(-s + s^2)} \right\}$$

$$\left\{ \left\{ \frac{1}{2} \right\}, \{\infty\} \right\}$$

```
asd = Simplify[Table[ie[s, a], {a, {.2, 1/2, .8, 1}}];
```

```
Plot[asd, {s, 1, 15}, PlotRange → {-2, 2}]
```



```
u[s_] := -Exp[-a (s - 1)] (s - 1)
```

```
D[u[s], {s, 1}]
```

```
D[u[s], {s, 2}]
```

$$-e^{-a(-1+s)} + a e^{-a(-1+s)} (-1+s)$$

Simplify[D[Exp[-w^2/2/t^2]/t,t]]

$$\frac{e^{-\frac{w^2}{2t^2}}(-t^2+w^2)}{t^4}$$