Plot Call and Put options prices versus T–t

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Crated on Mon 18 Oct 2021 10:14:47 PM CDT

$$\int_{-\infty}^{d} \frac{1}{\sqrt{2\,\pi}}\,\text{Exp}\left[\frac{-x^2}{2}\right]\,dl\ x$$

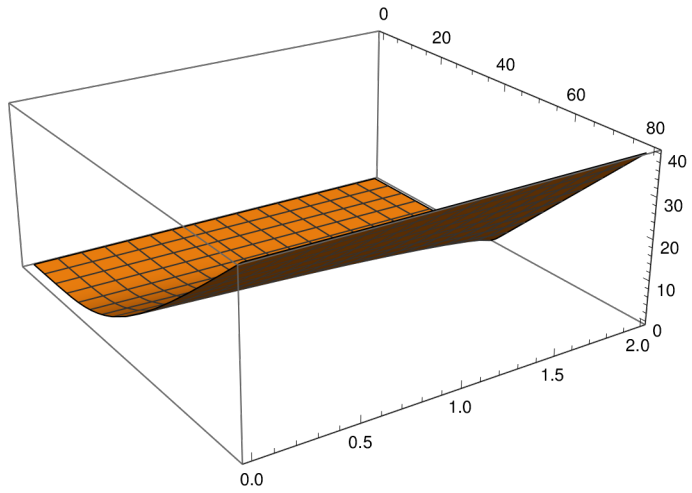
Out[ ]= $\frac{1}{2} \times \left(1 + \text{Erf}\left[\frac{d}{\sqrt{2}}\right]\right)$

In[ ]:=
```
n[d_] := 1/2 × (1 + Erf[d/Sqrt[2]])

d1 = (Log[S/K] + (r - δ + 1/2 σ^2) (T - t))/(σ Sqrt[T - t]);
d2 = d1 - σ Sqrt[T - t];
OptionCall = S e^(-δ (T-t)) n[d1] - K e^(-r (T-t)) n[d2];
OptionPut = K e^(-r (T-t)) n[-d2] - S e^(-δ (T-t)) n[-d1];
```

In[ ]:=
```
Plot3D[OptionCall /. {r → 0.08, δ → 0.04, K → 40, σ → 0.30, T → 2}, {S, 0, 80}, {t, 0, 1.99}]
```

Out[ ]=



In[ ]:=
```
Plot[Table[OptionCall /. {r → 0.08, δ → 0.04, K → 40, σ → 0.30, T → 2}, {t, 0, 1.99, 0.49}],
 {S, 0, 80}]
```

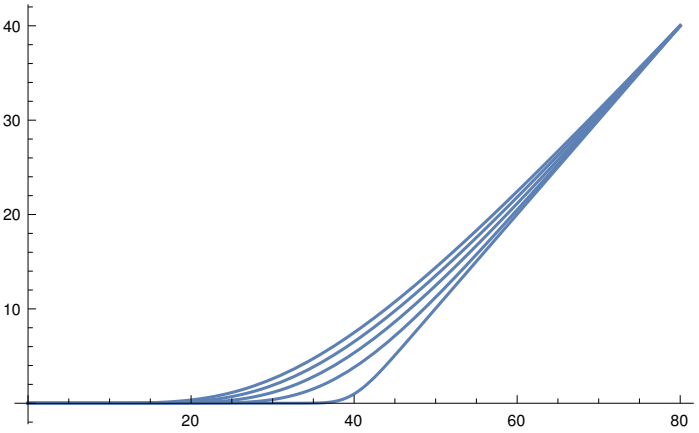
General : Exp[−1074.49] is too small to represent as a normalized machine number ; precision may be lost .

General : Exp[−1064.4] is too small to represent as a normalized machine number ; precision may be lost .

General : Exp[−14188.6] is too small to represent as a normalized machine number ; precision may be lost .

General : Further output of General ::munfl will be suppressed during this calculation .

Out[ ]=



In[ ]:=
```
Plot[Table[OptionPut /. {r → 0.08, δ → 0.04, K → 40, σ → 0.30, T → 2}, {t, 0, 1.99, 0.49}],
 {S, 0, 80}]
```

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Out[ ]=