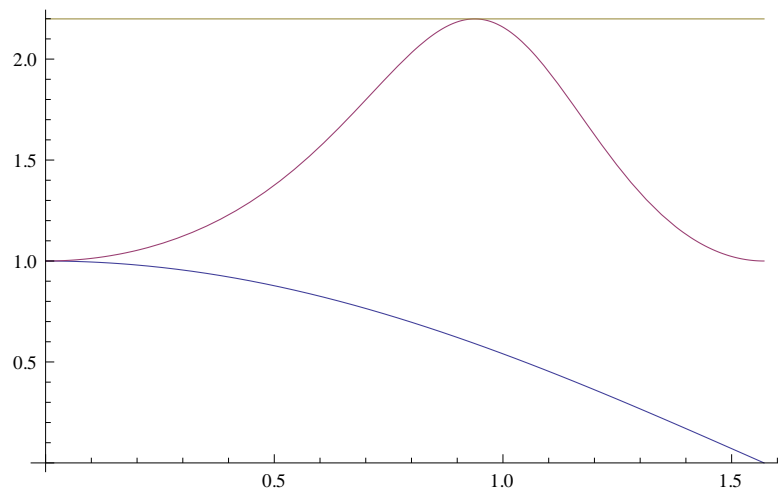


```
f[a_, E_] := (Cos[a]^2 + Exp[-E] * Sin[a]^2) / (Cos[a]^4 + Exp[-E] * Sin[a]^4)
```

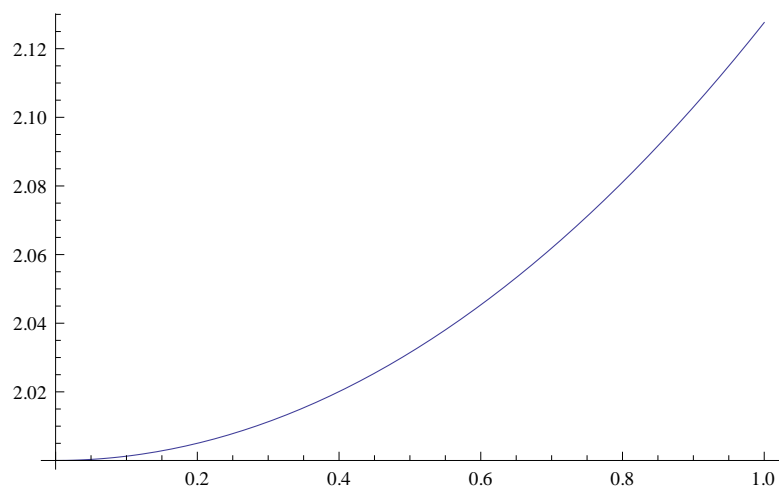
```
e = .138 * 9; Cos[ArcTan[Exp[e / 4]]]
```

```
Plot[{Cos[a], f[a, e], 1 + Cosh[e / 2]}, {a, 0, Pi / 2}]
```

```
0.591231
```



```
Plot[1/2 * e^(-tE/2) (1 + e^(tE/2))^2, {tE, 0, 1}]
```



```
Simplify[f[ArcTan[Exp[tE / 4]], tE]]
```

```
1/2 * e^(-tE/2) (1 + e^(tE/2))^2
```

```
Expand[1/2 * e^(-tE/2) (1 + e^(tE/2))^2]
```

```
1 + e^(-tE/2)/2 + e^(tE/2)/2
```

$$1 + \text{Cosh}[-tE / 2]$$

$$1 + \text{Cosh}\left[\frac{tE}{2}\right]$$

$$\text{Simplify}\left[D[f[a, e], a] * (\text{Cos}[a]^4 + e \text{Sin}[a]^4)^2\right]$$

$$\left((\text{Cos}[a]^4 + 1.242 \text{Sin}[a]^4)^2 (2.57761 \text{Cos}[a]^5 \text{Sin}[a] - 0.74443 \text{Cos}[a] \text{Sin}[a]^5) \right) / (\text{Cos}[a]^4 + 0.288806 \text{Sin}[a]^4)^2$$

$$\text{Solve}[\text{Cos}[a]^4 - e \text{Sin}[a]^4 == 0, a]$$

Solve::ifun :

Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information. >>

$$\begin{aligned} & \left\{ \left\{ a \rightarrow -\text{ArcCos}\left[-\sqrt{-\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \left\{ a \rightarrow \text{ArcCos}\left[-\sqrt{-\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \right. \\ & \left\{ a \rightarrow -\text{ArcCos}\left[\sqrt{-\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \left\{ a \rightarrow \text{ArcCos}\left[\sqrt{-\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \\ & \left\{ a \rightarrow -\text{ArcCos}\left[-\sqrt{\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \left\{ a \rightarrow \text{ArcCos}\left[-\sqrt{\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \\ & \left. \left\{ a \rightarrow -\text{ArcCos}\left[\sqrt{\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\}, \left\{ a \rightarrow \text{ArcCos}\left[\sqrt{\frac{\sqrt{e}}{-1+e}} + \frac{e}{-1+e}}\right] \right\} \right\} \end{aligned}$$