Problem 1

1.a

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1.b

Random **math** test[1]

$$\phi(t) = \frac{1}{\sqrt{2\pi}} \int_0^t e^{-x^2/2} dx$$

Problem 2

2.a

Some inference rule

$$\frac{\Gamma \vdash e_1 : \tau_1 \quad \Gamma \vdash e_2 : \tau_2}{\Gamma \vdash \underbrace{\langle e_1, e_2 \rangle}_{e} : \tau_1 \times \tau_2} \text{Meh}$$

2.b

This is some code trace for `fact 2`

```
fun fact 0 = 1
  | fact n = n * fact (n - 1)
```

$$
\begin{aligned}
\boxed{\texttt{fact 2}} &= \boxed{\texttt{2 * (fact (2 - 1))}} \text{ (definition of } \boxed{\texttt{fact}} \text{)} \\
&= \boxed{\texttt{2 * (fact 1)}} \text{ (math)} \\
&= \boxed{\texttt{2 * (1 * (fact (1 - 1)))}} \text{ (definition of } \boxed{\texttt{fact}} \text{)} \\
&= \boxed{\texttt{2 * (1 * (fact 0))}} \text{ (math)} \\
&= \boxed{\texttt{2 * (1 * 1)}} \text{ (definition of } \boxed{\texttt{fact}} \text{)} \\
&= \boxed{\texttt{2 * 1}} \text{ (math)} \\
&= \boxed{\texttt{2}} \text{ (math)}
\end{aligned}
$$

Problem 3

3.a

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[1]inspired by https://ilorentz.org/beenakker/MO/fonttest.tex