In this example we consider the following benchmark problem from elasticity theory:

$$(\sigma(u), \varepsilon(\varphi)) = (g, \varphi)_{\Gamma_N}. \tag{1}$$

Here $\tilde{\Omega}$ is a quadratic domain with side length 200 mm, where a circular hole with radius 10 mm around the center is cut out. Using symmetries of the domain, we restrict our actual computational domain Ω to the upper left quarter of $\tilde{\Omega}$.
In the above equation, $\varepsilon(v) := \frac{1}{2}(\nabla v + \nabla v^T)$ is the symmetric strain tensor, and

$$\sigma(v) := 2\mu\varepsilon(v)^D + \kappa \cdot tr(\varepsilon(v))I$$

denotes the symmetric stress tensor. Here τ^D is the deviatoric part of a tensor τ, in two dimensions defined as

$$\tau^D := \tau - \frac{1}{2}tr(\tau)I,$$

and the parameters μ and κ are chosen as $\mu = 80193.800283$ resp. $\kappa = 190937.589172$.
The corner points of our computational domain are in anticlockwise order: $(0,0), (90,0)$, $(100,10), (100,100)$ and $(0,100)$. We prescribe homogeneous Dirichlet boundary conditions in y-direction between $(0,0)$ and $(90,0)$ (lower boundary part), homogeneous Dirichlet boundary conditions in x-direction between $(100,10)$ and $(100,100)$ (right boundary part), and we interpret the righthand side of equation (1) with $g = 450$ as a boundary condition between $(0,100)$ and $(100,100)$ (upper boundary part).
The goal of our computations is to match the following functional reference values taken from *E. Stein (editor), Error-controlled Adaptive Finite Elements in Solid Mechanics, Wiley (2003), pp. 386 - 387*:

Functional	u_1 at $(90,0)$	σ_{22} at $(90,0)$	u_2 at $(100,100)$
Reference value	0.021290	1388.732343	0.20951

Functional	u_1 at $(0,100)$	$\int_{(100,100)}^{(0,100)} u_2$
Reference value	0.076758	20.40344