

# Worksheet 2

### Problem 1: Repeated Rounding

Let  $\text{round}_x(\cdot)$  mean rounding to the nearest multiple of  $x$ . Is  $\text{round}_1(\text{round}_{0.1}(y)) = \text{round}_1(y)$ ?  
Give a meaningful example.

### Problem 2: UFL and machine epsilon

	UFL...		$\epsilon_{\text{mach}}$ ...	
...depends on the exponent range.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> True	<input type="checkbox"/> False
...depends on the number of digits in the mantissa.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> True	<input type="checkbox"/> False
...depends on the rounding rule used.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> True	<input type="checkbox"/> False
...is not affected by denormals.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> True	<input type="checkbox"/> False

### Problem 3: Backward errors and $\epsilon_{\text{mach}}$

What is the significance of  $\epsilon_{\text{mach}}$  for backward error analysis?