Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment 2**

In the coil beam and spherical shell geometries the gradients at the mid-curve () or at the mid-surface () and the basis vector derivatives are

, , and

, , ,

respectively. Above *R*, *h* are constants. Use the definition  to find the curvature of the mid-curve of the coil beam and the mid-surface of the spherical shell.

**Solution template**

Since the basis vectors derivatives and the gradient expression are given, definition of the curvature can be used directly. For the coil beam

 

 

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For the spherical shell

 

 

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