

LECCION 5 - EJERCICIO 2 (16.2) v.2005

■ INICIO

```
Off [General::"spell1"]
```

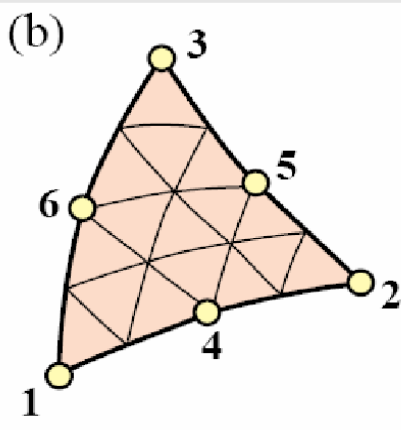
```
Off [General::"spell"]
```

■ ELEMENTO TRIANGULAR CUADRATICO DE SEIS NODOS



```
Tri6 =
```

```
Show[Tri6, ImageSize -> 200]
```



■ DEFINICION FUNCIONES DE FORMA EN COORDENADAS TRIANGULARES

$$N1 = \xi_1 * (2 * \xi_1 - 1) ;$$

$$N2 = \xi_2 * (2 * \xi_2 - 1) ;$$

$$N3 = \xi_3 * (2 * \xi_3 - 1) ;$$

$$N4 = 4 * \xi_1 * \xi_2 ;$$

$$N5 = 4 * \xi_2 * \xi_3 ;$$

$$N6 = 4 * \xi_3 * \xi_1 ;$$

■ COMPROBACION SUMA FUNCIONES DE FORMA

$$\text{Suma} = N1 + N2 + N3 + N4 + N5 + N6$$

$$\xi_1 (-1 + 2 \xi_1) + 4 \xi_1 \xi_2 + \xi_2 (-1 + 2 \xi_2) + 4 \xi_1 \xi_3 + 4 \xi_2 \xi_3 + \xi_3 (-1 + 2 \xi_3)$$

$$\text{Suma} = \text{Simplify}[N1 + N2 + N3 + N4 + N5 + N6]$$

$$\xi_1 (-1 + 2 \xi_1) + 4 \xi_1 \xi_2 + \xi_2 (-1 + 2 \xi_2) + 4 \xi_1 \xi_3 + 4 \xi_2 \xi_3 + \xi_3 (-1 + 2 \xi_3)$$

```
Suma = FullSimplify[N1 + N2 + N3 + N4 + N5 + N6]
```

```
( $\xi_1 + \xi_2 + \xi_3$ ) (-1 + 2  $\xi_1 + 2 \xi_2 + 2 \xi_3$ )
```

□ CONDICION COORDENADAS TRIANGULARES

```
Condicion =  $\xi_1 + \xi_2 + \xi_3 == 1$ ;
```

```
Solve[Condicion,  $\xi_1$ ]
```

```
{{ $\xi_1 \rightarrow 1 - \xi_2 - \xi_3$ }}
```

```
Solve[Condicion,  $\xi_1$ ][[1]]
```

```
{ $\xi_1 \rightarrow 1 - \xi_2 - \xi_3$ }
```

□ COMPROBACION

```
Suma = FullSimplify[Suma /. Solve[Condicion,  $\xi_1$ ][[1]]]
```

```
1
```