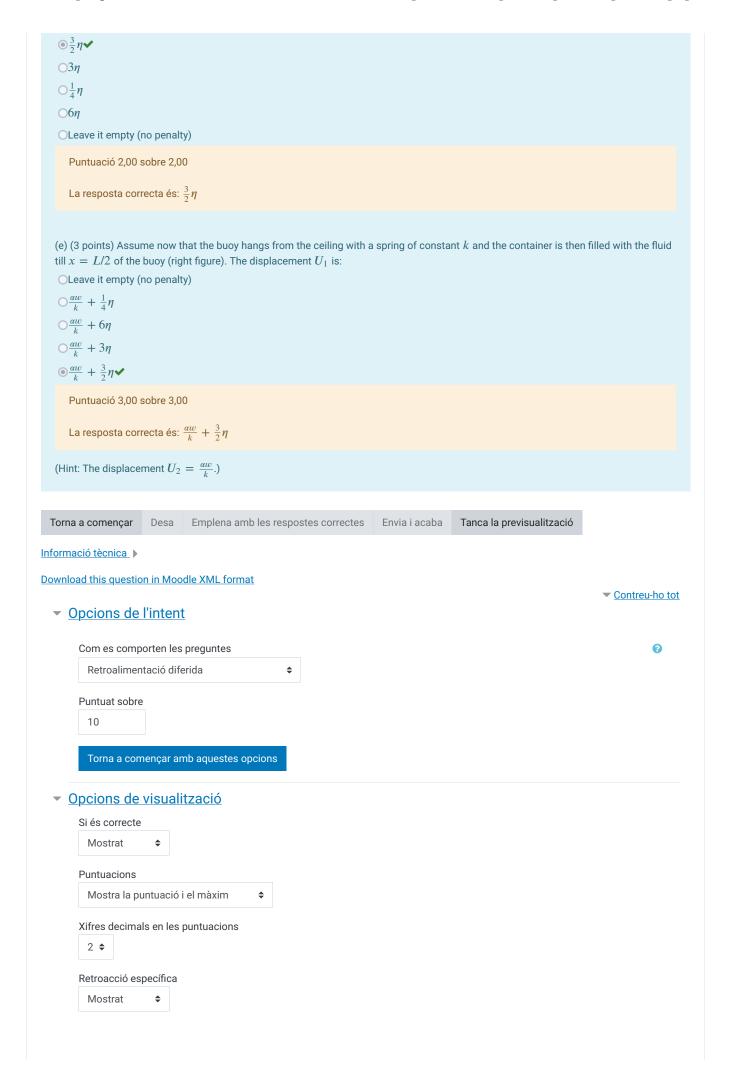
Pregunta <b>1</b>
Correcte Puntuació 10,00 sobre 10,00
A buoy of length $L=2$ , made of an elastic material of Young's modulus $E$ and negligible weight, is roped at the end $x=0$ to the bottom of a container and submerged up to $x=L/2$ in a fluid of specific weight $w$ , as it is displayed in the left figure. The area of the transversal section of the buoy is $A(x)$ , and the buoy is symmetric with respect to $x=L/2$ (i.e. $A(x)=A(2-x)$ ). Moreover, for the particular transversal section of the buoy, we know that, (pay attention to the limits of integration), \(\(\text{ int }_0^{L/2}A(x) \\rm d\x=\alpha,  \\rm (being $\alpha$ a known value).\}\) Consider just one 1D linear finite element $\Omega^1=[0,L]$ to approximate the elongation of the buoy when submerged, and note that the <b>external force</b> applied per unit of length exercised by the fluid on the buoy is $f(x)=A(x)w$ , only applied to the submerged part. Questions: (a)(1 point) The value of $\psi_2^1(1)$ is,
$\circ \frac{3}{4}$
$\circ \frac{1}{4}$
$\circ \frac{2}{3}$
OLeave it empty (no penalty)
$ledot \frac{1}{2} \checkmark$
Puntuació 1,00 sobre 1,00
La resposta correcta és: $\frac{1}{2}$
(b) (1 point) The value of $K_{11}$ is, $\frac{2\alpha E}{L}$ $\frac{4\alpha E}{L}$ $\frac{2\alpha E}{L^2} \checkmark$ OLeave it empty (no penalty) $\frac{4\alpha E}{L^2}$
Puntuació 1,00 sobre 1,00
La resposta correcta és: $\frac{2\alpha E}{L^2}$
(c) (3 points) Let us define $\eta=w/E$ . The elongation of the buoy is: $\odot \frac{1}{2} \eta \checkmark$
$\circ 2\eta$
$\bigcirc rac{1}{4}\eta$
$\bigcirc \frac{3}{2}\eta$
OLeave it empty (no penalty)
Puntuació 3,00 sobre 3,00
La resposta correcta és: $rac{1}{2}\eta$
(d) (2 points) Consider the same buoy, again submerged up to $x=L/2$ , but now without the rope and being the top of the buoy stopped by the ceiling (central figure). Using again a linear 1D finite element, the contraction of the buoy is:

1 de 3 11/1/23 14:32

Previsualitza la pre	egunta: 4	
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2 de 3 11/1/23 14:32