The Finite Element Method of solving PDEs involves the following steps: 1) Discretizing the domain into a finite number of elements 2) Formulating a set of equations for each element 3) Assembling a system of equations for the entire domain from those obtained for a single element and solving the assembled set of equations. Triangulating falls under:

1 points

- (●) Step 1 ✓
- ( ) Step 2
- ( ) Step 3

Feedback for correct answers

Triangulating is part of the discretizing process

Feedback for incorrect answers

Triangulating is part of the discretizing process

In The Finite Element Method of solving PDEs the strong-form equation is converted to weak-form. This is done in order to:

1 points

- [x] Reduce the complexity ✓
- [ ] Reduce the strength
- [ ] Reduce errors

Feedback for correct answers

Formulations of governing equations from strong-form to weak-form are derived to simplify the numerical computing

Feedback for incorrect answers

Formulations of governing equations from strong-form to weak-form are derived to simplify the numerical computing

In The Finite Element Method approach to computing displacements along various points of a 1D rod element fixed at one end and subjected to axial and body forces with given initial displacements, the assembled system of weak-form equations to solve represents a relationship between: 1) the global stiffness matrix, 2) displacements, 3) boundary condition vector, and 4) body force vector. Which among 1 to 4 contain integral expressions that may need to be computed using numerical integration schemes (more than one answer may apply)?

1 points

- [x] 1 ✓
- [ ] 2
- [ ] 3
- [x] 4 ✓

Feedback for correct answers

The stiffness matrix and the body force vector contain integral expressions that may need to be computed using numerical integration schemes

Feedback for incorrect answers

The stiffness matrix and the body force vector contain integral expressions that may need to be computed using numerical integration schemes

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If I have to integrate a linear polynomial function, what is the Gauss-Quadrature rule that would suffice?

1 points

1. 1-Point quadrature rule ✓
2. 0-point quadrature rule
3. 2-point quadrature rule

Feedback for correct answers

As per the Gauss-Quadrature rules, an n-point quadrature rule can be used to integrate polynomials of the order up to 2n-1. So, a linear polynomial (degree 1) can be used with 1-point quadrature rule.

Feedback for incorrect answers

As per the Gauss-Quadrature rules, an n-point quadrature rule can be used to integrate polynomials of the order up to 2n-1. So, a linear polynomial (degree 1) can be used with 1-point quadrature rule.