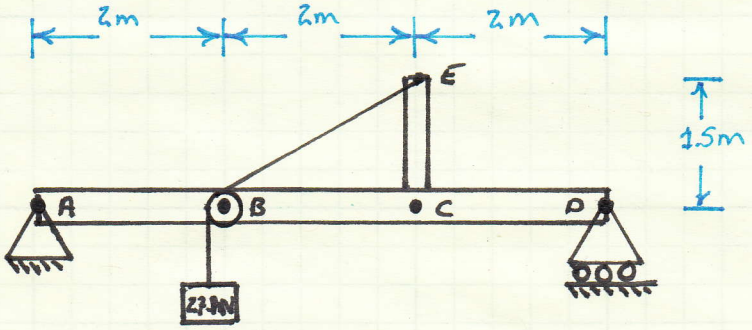
PROBLEM 8 CONSTRUCT THE SHEAR FORCE, BENDING MOMENT, CURVATURE, AND DEFLECTION DIAGRAMS FOR THIS BEAM.

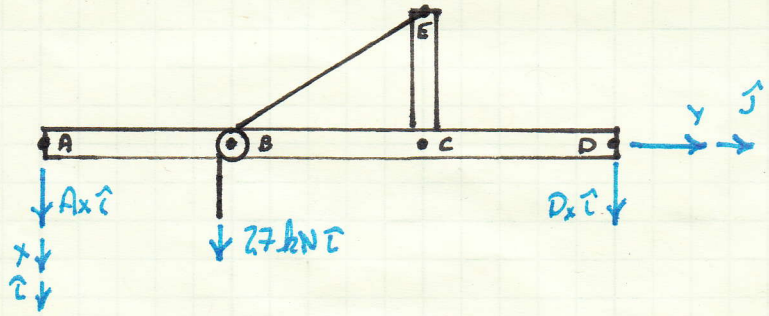
GIVEN:
1. A SIMPLY SUPPORTED BEAM OF LENGTH 6 m.
2. 1.5m VERTICAL ARM LOCATED 4 m FROM THE LEFT END OF THE BEAM
3. A POLLEY LOCATED ON THE HORIZONTAL BEAM 2m FROM THE LEFT END.
4. A CABLE ATTACHED AT THE TOP OF THE VERTICAL ARM WRAPPING AROUND THE POLLEY.
5. 27 kN LOAD ATTACHED TO THE CABLE UNDER THE BEAM

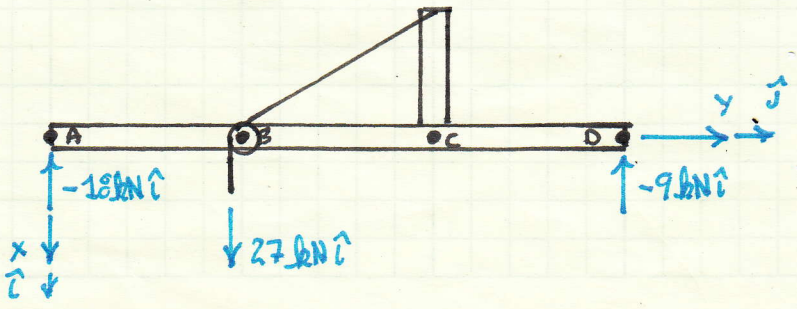
ASSUMPTIONS:
1. THE BEAM IS ORIGINALLY STRAIGHT, THE HORIZONTAL DEFLECTIONS ARE SMALL
2. LINEAR-ELASTIC MATERIAL RESPONSE
3. VERTICAL ARM IS RIGID
4. THE CABLE IS RIGID
5. THE ROLLER IS FRICTIONLESS AND THE RADIUS CAN BE IGNORED.

FIND:
1. SHEAR DIAGRAM
2. BENDING MOMENT DIAGRAM
3. CURVATURE (ELASTIC CURVE SLOPE) DIAGRAM
4. DISPLACEMENT DIAGRAM

FIGURE:







(a)

SOLUTION DIAGRAMS: