1. Q = UAΔTm

Where ΔTm is the logarithm mean temperature difference

For initial condition,

Q = (m1 4.18) (320 – 280 ) = U1A1

162.2m1 = U1A1

= m1/U1A1 = 0.345

In the second case m2=m1 , u2=u1 and A2=5A1

Q2= (m1 4.18)(T-280)=5U1A1

4.18(m1/U1A1) =

Substitute for m1/U1A1

0.289(T-280)=

T= 357.5K

2. Fourier's law, states that the rate of heat transfer through a material is proportional to the negative gradient in the temperature and to the area, at right angles to that gradient, through which the heat flows.

3.Conduction is a process in which heat is transported between parts of a continuum, through direct physical contact.

WHILE

Convection is the principle, wherein heat is transmitted by currents in a fluid, i.e. liquid or gas.

WHILE

Radiation is the heat transfer mechanism, in which the transition takes place through electromagnetic waves.