**COLLECTION OF RATE OF CHANGE PROBLEMS.**

1. The heat H, generated in a furnace at t hours can be modelled by:

 *H = 8e0.4t + 6 ln(4t + 3*)

What is the **rate of increase** of heat generation at t = 5 hours?

***We want dH***

 ***dt***

2. The distance of a particle from the origin, O can be modelled by the

 equation :

 D = 20 ln(t + 3) – 4 √ t

where D is the distance from O in metres and t is the time in seconds.

Find the exact velocity of the particle at t = 2 sec.

***We want v = dD***

 ***dt***

3. The temperature of a cup of tea T0C at t minutes after it was poured is given

 by the formula : ***T = 22 + 70e – 0.2t***

(a) find the actual temperature of the tea initially as it is poured (at t = 0 min.)

***We want T***

(b) find the actual temperature of the tea at t = 10 min.

***We want T***

(c) find the actual temperature of the tea after a long time ( subs t = 60 min)

 ***(what do you think the ROOM temperature is?)***

***We want T***

(d) find the RATE of change of the temperature at t = 15 min.

***We want dT***

 ***dt***

(e) find the RATE of change of the temperature at t = 1 min.

***We want dT***

 ***dt***