Class 9

Epidemic? Or false alert?

What does it mean to have an epidemic?

So, to have an epidemic means

$$I'$$

Recall our S-I-R model:
$S' = -.00001SI$
$I' = .00001SI - I/14$
$R' = I/14$

Given the present values:
$S = 45400$, $I = 2100$, $R = 2500$,
how can we tell whether or not we are currently having an epidemic?

What if S was 5000, with everything else unchanged; would there be an epidemic?

What if S was 10000, with everything else unchanged; would there be an epidemic?

What is the HIGHEST possible value for S that will NOT turn into an epidemic?

This value is called the threshold value for an epidemic.

Q: How would you modify the model above if the recovery period for the disease was one week?

Q: Suppose a disease is modelled by the equations:
$S' = -.00002SI$, $I' = .00002SI - 0.1I$, and $R' = 0.1I$.
How long is the recovery period for this disease?

Get into groups, and do excercises 23-26 from section 1 of CiC.

ANNOUNCEMENTS

Exam: Thursday, 9/24/98. Homework, due Wednesday, 9/23/98:
Do: CiC, section 1.1 : 20, 22, 23-26.

Finding the slope of a curve

Draw an accurate sketch of the parabola $y = x^2$. At the point (1.6, 2.56) draw THE tangent line to curve.

Estimate from your graph, as accurately as you can, the slope of the tangent line you drew .

Let p and q be the points

$$p = (1.5, \quad), \quad q = (1.7, \quad)$$

What is the slope of the line that goes through p and q?

Compare this to your estimate of the slope of the tangent line. Which do you think is closer to the ACTUAL slope of the tangent line?

Use successive approximations to find the slope of the tangent line accurate to 3 decimal places.