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Matric No: 19/ENG06/027.

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**Question**

1. Determine the stationary point, coordinate of the stationary point and nature of the stationary point of the curve

                     y = t3- t2/2 - 2t + 4

2. If 2y2- 5x4- 2 - 7y3= 0, find dy/dx

3. Find dy/dx if 4x2+2xy3-5y2=0  and evaluate dy/dx when x=1 and y=2.

**Solution**

**(1)**

                     y = t3- t2/2 - 2t + 4

= t2 - t -2

The stationary point is = t2 - t -2

At stationary point = 0

3t2 – t – 2 = 0

3t2 –3t + 2t – 2 = 0

3t(t-1) +2(t-1) = 0

(3t + 2) (t – 1) = 0

3t = 2 or t = 1

t = or t = 1

ymax = (3 – -2(- + 4

y= - + + 4

=

y = coordinates are (t,y)

= (-)

= 6t – 1

At t = -

= -4-1 = -5

It is a maxima

Also, At t = 1

= 6-1

= 5

It is a maxima

ymin = 13 - – 2(1) + 4  
 = 1 - -2 +4

ymin = 3 -

=

=

Coordinates (t2, y2) = (1, )

**(2)**

If 2y2- 5x4- 2 - 7y3= 0

4y -20x3 – 21y2 = 0

4y -21y2 = 20x3

=

**(3)**

4x2 + 2xy3 – 5y2 = 0

8x + 2y3 + 6xy2 – 10y = 0

6xy2 – 10y = -8x – 2y3

(6xy2 – 10y) = -8 -2y3

=

At x = 1, y =2;

=

= = -6