MON 11-14-05

Ex) FIND THE SLOPE OF THE LINE(S) TANGENT TO $x^2+y^2=25$ WHEN $x=3$.

SOLN: IMPLICITLY:

$$2x+2y\cdot y'=0$$

$$2y\cdot y'=-2x$$

$$y'=\frac{-2x}{2y}=\frac{-x}{y}=m_{tan}$$

$x=3 \rightarrow y^2=16$

$y=\pm 4$

$(3,4)$ $m_{tan1}=-\frac{3}{4}$

$(3,-4)$ $m_{tan2}=\frac{3}{4}$

SAME PROBLEM: EXPLICITLY

$x^2+y^2=25$ WHEN $x=3$

$y^2 = 25-x^2$

$y = \pm\sqrt{25-x^2}$

$y_1 = (25-x^2)^{\frac{1}{2}}$ & $y_2 = -(25-x^2)^{\frac{1}{2}}$

$y_1' = \frac{1}{2}(25-x^2)^{-\frac{1}{2}} \cdot -2x$

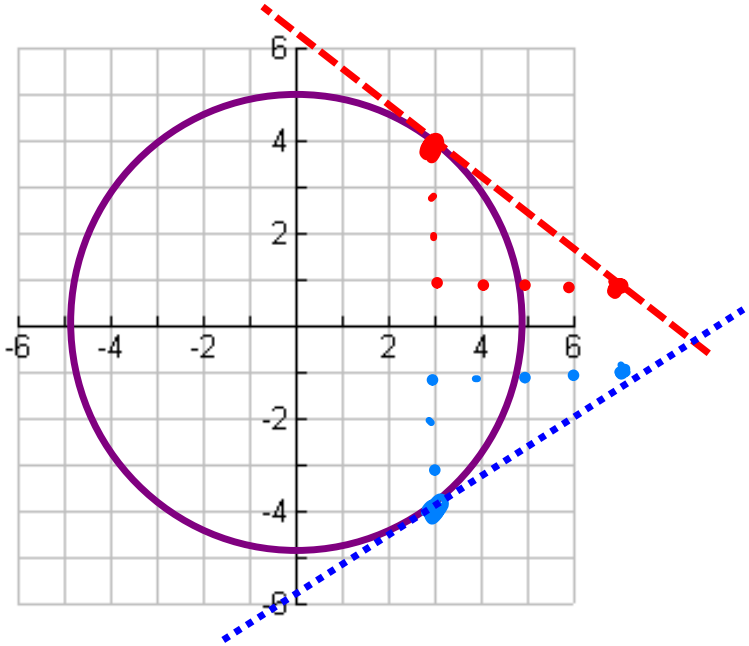
$y_1' = \frac{-x}{\sqrt{25-x^2}}$

$y_2' = \frac{x}{\sqrt{25-x^2}}$

$y_1'(x=3) = \frac{-3}{\sqrt{25-9}}$

$= \frac{-3}{4}$

$m = \frac{3}{4}$


6
4
2
-6
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2
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6
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-4

P.155-7

(8) $\frac{dy}{dx} = \frac{1}{(x^2+1)\sqrt{x^2+1}} = \frac{1}{(x^2+1)^{\frac{3}{2}}}$

(26) $y'' = \frac{-1}{(y+1)^3}$

?

8 10

35 8

23 4

25 4

P.155-7

(3) $y = \dfrac{x}{\sqrt{x^2+1}} = \dfrac{x}{(x^2+1)^{\frac{1}{2}}}$ $\begin{cases} u \\ v \end{cases}$

$\dfrac{v \cdot u' - u \cdot v'}{v^2}$

$$y' = \frac{\sqrt{x^2+1} \cdot 1 - x \cdot \frac{1}{2}(x^2+1)^{-\frac{1}{2}} \cdot 2x}{(\sqrt{x^2+1})^2}$$

$$y' = \frac{\sqrt{x^2+1} - \dfrac{x^2}{\sqrt{x^2+1}}}{x^2+1} \cdot \frac{\sqrt{x^2+1}}{\sqrt{x^2+1}}$$

$$y' = \frac{x^2+1-x^2}{(x^2+1)\sqrt{x^2+1}}$$

$$y' = \frac{1}{(x^2+1)\sqrt{x^2+1}}$$

(35) $y = 2\sin(\pi x - y)\,;\ (1,0)$

$y' = \underline{2} \cdot \cos(\pi x - y) \cdot (\underline{\pi} - y')$

$y' = 2\pi\cos(\pi x - y) - 2 \cdot y' \cdot \cos(\pi x - y)$

$y' + 2 \cdot y' \cdot \cos(\pi x - y) = 2\pi\cos(\pi x - y)$

$y'(1 + 2\cos(\pi x - y)) = 2\pi\cos(\pi x - y)$

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O.T.L.

* CORRECT LAST 2 DAY'S O.T.L.

- READ p. 157-158 THRU EXPLORATION 1.
- P. 155 #26
- Do p. 162 QUICK REVIEW 1-9 (REFER TO SECTION 1.5 AS NEEDED) DO IT
- REVIEW TRIG ESSENTIALS: INVERSE TRIG FUNCTIONS