Mathematics 122

You must show your work to get full credit.

(1) Find the equation of the tangent line to $y = x^2 - 6x + 4$ at the point were $x = 2$.

2 pts

$y - y_0 = m(x - x_0)$

Equation is $\dfrac{y + 4 = -2(x-2)}{\text{or} \quad y = -2x}$

$x_0 = 2$

$y_0 = y|_{x=2} = 2^2 - 6 \cdot 2 + 4 = 4 - 12 + 4 = -4$

$y' = 2x - 6$

$m = y'|_{x=2} = 2 \cdot 2 - 6 = -2$

$y - (-4) = -2(x-2)$

$y + 4 = -2(x-2)$

(2) Find the point (both x and y coordinates) on the graph of $y = x^2 - 6x + 4$ where $y' = 0$.

3 pts

$y' = 2x - 6$

$(x, y) = \underline{(3, -5)}$

so we want to solve

$y' = 2x - 6 = 0$

$2x = 6$

$x = 3.$

To get the y value plus x=3 back into the original equation

$y = 3^2 - 6 \cdot 3 + 4 = 9 - 18 + 4$

$= 13 - 18 = -5$