SATPREP

Assignment: Equation of tangent and normal

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

1) $y = x^2 - 2x + 2$ at $(1, 1)$

2) $y = -\dfrac{x^2}{2} - 3x + \dfrac{3}{2}$ at $\left(-2, \dfrac{11}{2}\right)$

3) $y = \dfrac{x^2}{2} - 3x + \dfrac{5}{2}$ at $(-1, 6)$

4) $y = 2x^2 - 12x + 20$ at $(2, 4)$

5) $y = 2x^2 - 16x + 34$ at $(3, 4)$

6) $y = (x + 2)^{\frac{1}{2}}$ at $(-1, 1)$

For each problem, find the equation of the line normal to the function at the given point. If the normal line is a vertical line, indicate so. Otherwise, your answer should be in slope-intecept form.

7) $y = \ln (x)$ at $(2, \ln 2)$

8) $y = e^{-x + 2}$ at $\left(3, \dfrac{1}{e}\right)$

9) $y = 2x^2 - 4x + 1$ at $(-1, 7)$

10) $y = e^{x - 1}$ at $(2, e)$

11) $y = -x^2 + 6x - 8$ at $(1, -3)$

12) $y = x^3 - 3x^2 + 3$ at $(-1, -1)$

Answers to Assignment: Equation of tangent and normal (ID: 1)

1) $y = 1$

2) $y = -x + \dfrac{7}{2}$

3) $y = -4x + 2$

4) $y = -4x + 12$

5) $y = -4x + 16$

6) $y = \dfrac{1}{2}x + \dfrac{3}{2}$

7) $y = -2x + \ln 2 + 4$

8) $y = ex + \dfrac{-3e^2 + 1}{e}$

9) $y = \dfrac{1}{8}x + \dfrac{57}{8}$

10) $y = -\dfrac{1}{e} \cdot x + \dfrac{e^2 + 2}{e}$

11) $y = -\dfrac{1}{4}x - \dfrac{11}{4}$

12) $y = -\dfrac{1}{9}x - \dfrac{10}{9}$