Calculus Name_____ ID: 1

For each problem, find the slope of the function at the given value. Then write the equations of the Tangent & Normal lines

I'll do this one as a refresher

1) $y = -\frac{x^2}{2} - x + \frac{11}{2}$ at $x = -3$

Roll 2 Dice. Record the # of DITS.

Repeat 5 Times.

Complete Those 6 exercises.

Show a limit expression at least once.

2) $y = x^2 + 2x + 2$ at $x = -3$

Slope = -4

Normal Line $y - 5 = \frac{1}{4}(x+3)$ Tangent $y - 5 = -4(x+3)$

3) $y = \frac{x^2}{2} - 2x + 4$ at $x = 0$

Slope -2 Tangent Line. $y - 4 = -2(x-0)$

Normal $y - 4 = \frac{1}{2}(x-0)$

4) $y = \frac{x^2}{2} + 3x + \frac{5}{2}$ at $x = 0$

Slope 3 $(0, \frac{5}{2})$

Tangent $y - \frac{5}{2} = 3(x-0)$ Normal $y - \frac{5}{2} = -\frac{1}{3}(x-0)$

5) $y = -2x^2 - 12x - 17$ at $x = -3$

Slope $= 0$

Tangent line $y = -17$

Normal line

$x = -3$

6) $y = 2x^2 + 4x - 3$ at $x = -2$

Slope -8 $(-2, -3)$

Tangent

$y + 3 = -8(x + 2)$

Normal line

$y + 3 = \frac{1}{8}(x + 2)$

7) $y = \frac{x^2}{2} - 2x - 2$ at $x = -1$

Slope $= -3$ $(-1, \frac{1}{2})$

Tangent line

$y - \frac{1}{2} = -3(x + 1)$

Normal line

$y - \frac{1}{2} = \frac{1}{3}(x + 1)$

8) $y = 2x^2 + 12x + 18$ at $x = -3$

Slope $= 0$

Tangent line

$y = 18$

Normal line

$x = -3$

9) $y = -x^2 + 4x$ at $x = 3$

Slope -2 $(3, 3)$

Tangent line

$y - 3 = -2(x - 3)$

Normal line

$y - 3 = \frac{1}{2}(x - 3)$

10) $y = -x^2 + 5$ at $x = 0$

Slope 0 (0, 5)

Tangent line $y = 5$

Normal line $x = 0$

11) $y = -2x^2 + 6$ at $x = 2$

Slope $= -8$ (2, -2)

Tangent line $y + 2 = -8(x - 2)$

Normal line $y + 2 = \frac{1}{8}(x - 2)$

12) $y = x^2 - 6x + 10$ at $x = 2$

Slope $= -2$ (2, 2)

Tangent line $y - 2 = -2(x - 2)$

Normal line $y - 2 = \frac{1}{2}(x - 2)$

This is Barns

13) $y = -\frac{3}{x - 3}$ at $x = 1$

Slope $\frac{3}{4}$ $(1, -\frac{3}{2})$

Tangent $y + \frac{3}{2} = \frac{3}{4}(x - 1)$

Normal line $y + \frac{3}{2} = -\frac{4}{3}(x - 1)$

(13)

$$F(1+h) = -\frac{3}{1+h-3}$$

$$F(1) = \frac{-3}{-2} \quad \frac{3}{2} \quad -\frac{3}{h-2}$$

$$\lim_{h \to 0} \frac{-\frac{3}{h-2} - \frac{3}{2}}{h}$$

$$\frac{-6-3(h-2)}{2(h-2)} \cdot \frac{1}{h}$$

$$\frac{-6-3h+6}{2(h-2)} \cdot \frac{1}{h}$$

$$\lim_{h \to 0} \frac{-3}{2(h-2)} \to \frac{-3}{-4} = \frac{3}{4}$$

$(1, -\frac{3}{2})$