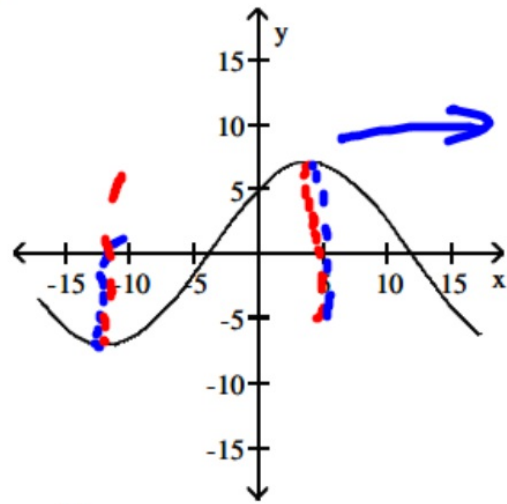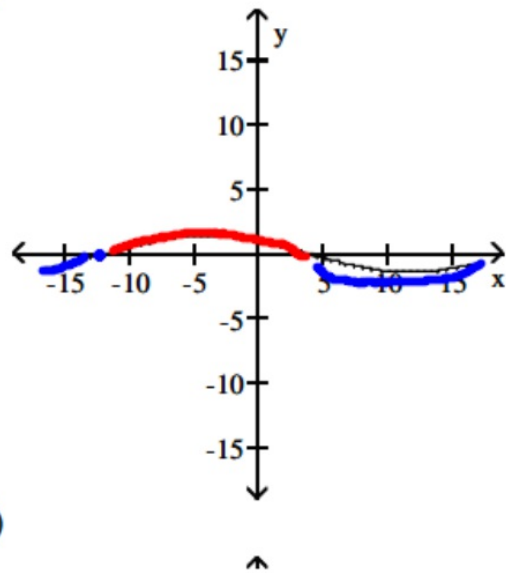The graph of a function is given. Choose the answe:

1)

A)

C)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

$$y = 8x - 17$$

2) If $y = x^3 - 4x - 1$, find an equation of the tangent line to the graph of y at $x = 2$.

2) _____

$$y' = 3x^2 - 4 \rightarrow 3(2)^2 - 4 = 3(4) - 4 = 8$$

If the function is not differentiable at the given value of x, tell whether the problem is a corner, cusp, vertical tangent, or a discontinuity (be able to identify ALL non differentiable types– corner, cusp, discontinuity, or vertical tangent).

3) $y = 2 - \sqrt[3]{x}$ at $x = 0$

3) _____

vertical
tangent

1

$$(-\infty, -9) \cup (-9, 9) \cup (9, \infty)$$

Determine the values of x for which the function is differentiable.

4) $y = \dfrac{1}{x^2 - 81}$

$-3 \mp 1.$

4) _____

$m = 0$

$x = -1$

Find the horizontal tangents of the curve.

5) $y = 4x^2 + 8x + 6$

$y' = 8x + 8 = 0$

5) _____

Find dy/dx.

6) $y = \dfrac{1}{2}x^{10} - \dfrac{1}{3}x^3$

$y' = 5x^9 - x^2$

$y' = 6x + 8 - \dfrac{9}{x^4}$

6) _____

7) $y = 3x^2 + 8x + 3x^{-3}$

$y' = 6x + 8 - 9x^{-4}$

8) $y = (x^2 - 5x + 2)(4x^3 - x^2 + 5)$

$f \qquad g$

$f = x^2 - 5x + 2 \begin{cases} g = 4x^3 - x^2 + 5 \\ \\ g' = 12x^2 - 2x \end{cases}$

$f' = 2x - 5$

$= (2x - 5)(4x^3 - x^2 + 5) + (12x^2 - 2x)(x^2 - 5x + 2)$

9) $y = \dfrac{8x^2 + x - 1}{x^3 - 9x^2}$

$f = 8x^2 + x - 1 \quad g = x^3 - 9x^2$

$f' = 16x + 1 \quad g' = 3x^2 - 18x$

$$\frac{(x^3 - 9x^2)(16x + 1) - (8x^2 + x - 1)(3x^2 - 18x)}{(x^3 - 9x^2)^2}$$