

## AP CALCULUS AB

## QUIZ #3 STUDY GUIDE

- 1) Calculate the slope of the secant  $m_S(x, h)$  and the slope of the tangent  $m_T(x)$  for

$$f(x) = \frac{1}{x^3}.$$

- 2) Calculate  $f'(x)$  for

$$f(x) = 5x^3 + 13x^2 - 11x + 29.$$

- 3) Calculate  $f'(x)$  for

$$f(x) = \frac{4}{x^5} - \frac{6}{x^7}.$$

Express your result in terms of positive exponents.

- 4) Calculate  $f'(x)$  for

$$f(x) = 13 \cdot \sqrt[9]{x^{11}} - \frac{14}{\sqrt[7]{x^4}}.$$

Express your answer in terms of radicals.

- 5) Find the  $x$  - values for which

$$f(x) = 2x^3 - x^2 - 48x \text{ has horizontal tangents.}$$

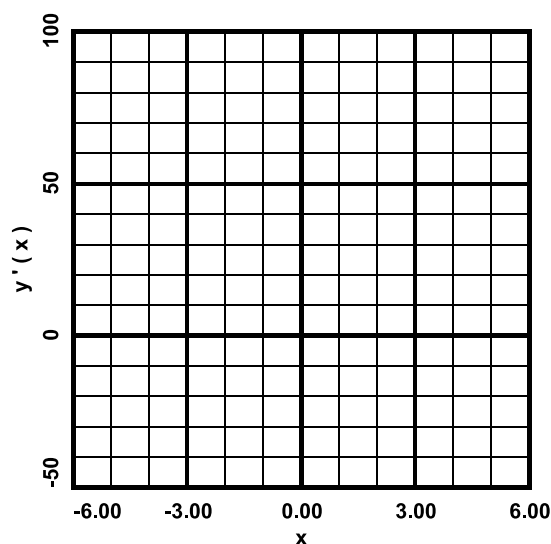
- 6) Given the function  $y = y(x)$  as defined by the table:

$x$	$y$
-4.8	-13.8
-3.7	62.6
-2.5	82.5
-1.3	56.3
1.4	-63.6
2.8	-98.3
3.6	-92.4
4.7	-40.0
5.5	38.5

- a) Fill in the table below using numerical differentiation.

$x$	$y'$

- b) Graph the points from part **a** on the grid.



- 7) Use the definition of derivative from the left

$$LD(3) = \lim_{x \rightarrow 3^-} \frac{f(3) - f(x)}{3 - x}$$

and the definition of derivative from the right

$$RD(3) = \lim_{x \rightarrow 3^+} \frac{f(x) - f(3)}{x - 3}$$

to calculate  $LD(3)$  and  $RD(3)$  for

$$f(x) = \begin{cases} x^2 - 4x + 6 & , \quad -\infty < x < 3 \\ -x^2 + 8x - 11 & , \quad 3 \leq x < \infty \end{cases}.$$

## AP CALCULUS AB

For problems **8** through **10**, state the  $x$  – interval for which  $f(x)$  is differentiable.

**8)**

$$f(x) = \begin{cases} x^2 - 4x + 6 & , \quad -\infty < x < 3 \\ -x^2 + 8x - 11 & , \quad 3 \leq x < \infty \end{cases}.$$

**9)**

$$f(x) = \frac{7}{x^2 + 4}$$

**10)**

$$f(x) = \frac{x + 8}{4x^2 + 7x - 15}$$