

# AP CALCULUS AB

# QUIZ #5 STUDY GUIDE

For problems 1 through 3, calculate  $f'(x)$ .

1)

$$f(x) = \csc(3x^2 + 5x + 7)$$

2)

$$f(x) = \cos(\cot(4x))$$

3)

$$f(x) = \left( \frac{\sin x}{1 + \cos x} \right)^2$$

4) Use the table

$x$	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
3	5	6	4	7
5	1	2	8	9
6	10	11	12	13

to calculate the indicated derivatives at  $x = 3$ .

a)

$$\frac{d}{dx}(f \cdot g)$$

b)

$$\frac{d}{dx}\left(\frac{f}{g}\right)$$

c)

$$\frac{d}{dx}f(g(x))$$

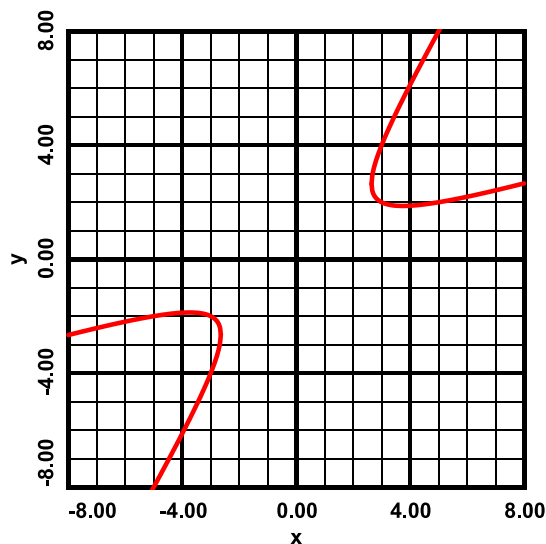
d)

$$\frac{d}{dx}g(f(x))$$

5) Implicitly differentiate  $y \tan(xy) = 5$  with respect to  $x$ .

6) Find the equation of the line tangent to  $x^4y + 2xy^4 = 372$  at  $(x, y) = (2, 3)$ .

7) The hyperbola  $x^2 + 2y^2 - 4xy + 7 = 0$  has the graph as shown.



Find the coordinates of the points on the hyperbola where

a) the tangent lines are horizontal

b) the tangent lines are vertical.

8) For

$$f(x) = -\frac{13}{90}x^3 + \frac{199}{90}x^2 - \frac{142}{15}x + \frac{67}{5},$$

calculate the equation of the line tangent to  $y = f^{-1}(x)$  at  $(x, y) = (5, 6)$ .