

Calculus - Derivative Doodle from The Far Side...

Find the answer to each derivative problem below and write its corresponding letter in the blank beside the problem number. After you have completed all the problems, find the caption to the doodle by substituting letters in the appropriate blanks.

In problems 1 - 7, use the following table of values at $x=1$ and $x=-2$ to determine the indicated derivatives:

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	1	3	-2	-1
-2	-2	-5	1	7

Problems

_____ 1. $\frac{d}{dx}[f^2(x) - 3g(x^2)]$ at $x = 1$

_____ 2. $\frac{d}{dx}[f(x)g(x)]$ at $x = -2$

_____ 3. $\frac{d}{dx}[f(g(x))]$ at $x = 1$

_____ 4. $\frac{d}{dx}[f(g(x))]$ at $x = -2$

_____ 5. $\frac{d}{dx}[g(g(x))]$ at $x = -2$

_____ 6. $\frac{d}{dx}[g^3(x)]$ at $x = 1$

_____ 7. $\frac{d}{dx}[f(g(4-6x))]$ at $x = 1$

_____ 8. If $y = (4x^2 - 1)(7x^3 + x)$, find y'

_____ 9. Determine $\frac{d}{dx}(\sqrt{x})$

_____ 10. If $y = \pi^3$, find $\frac{dy}{dx}$

Answers

A. $-\frac{1}{x^2}$

C. $-\sin\left(\frac{x}{2}\right)$

D. 12

E. $-\frac{1}{2}\cos\left(\frac{x}{2}\right)$

F. $\frac{1}{2\sqrt{x}}$

G. $140x^4 - 9x^2 - 1$

H. $-\frac{x}{y}$

I. -19

L. 5

M. $y = -3x + 17$

N. $y = 5x + 17$

O. 0

P. 21

S. -7

T. nonexistent

U. -12

Y -126

Z. None of the above

____ 11. If $x + 2xy - y^2 = 2$, then $\frac{dy}{dx}$ at (1,1) is:

____ 12. If $y = 2 \cos(\frac{x}{2})$, then $\frac{d^2y}{dx^2} =$

____ 13. If $f(x) = \frac{1}{x}$, then $f'(x) =$

____ 14. Find $\frac{dy}{dx}$ if $x^2 + y^2 = 100$

____ 15. Find an equation of the tangent line to the graph $y = f(x)$ at the point where $x = -3$ if $f(-3) = 2$ and $f'(-3) = 5$.

11 14 12 3 13 5 11 11 14 2 15 8 7 10 6

5 12 12 10 9 13 5 13 15 15 10 7 12 1

12 3 12 4 14 13 15 11

Can you determine the Title for this Far Side Doodle?

