

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

Answers

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

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

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

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

D. 12

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

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

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

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

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

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

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

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

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

I. -19

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

L. 5

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

M.  $y = -3x + 17$

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

N.  $y = 5x + 17$

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

O. 0

P. 21

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

S. -7

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

T. nonexistent

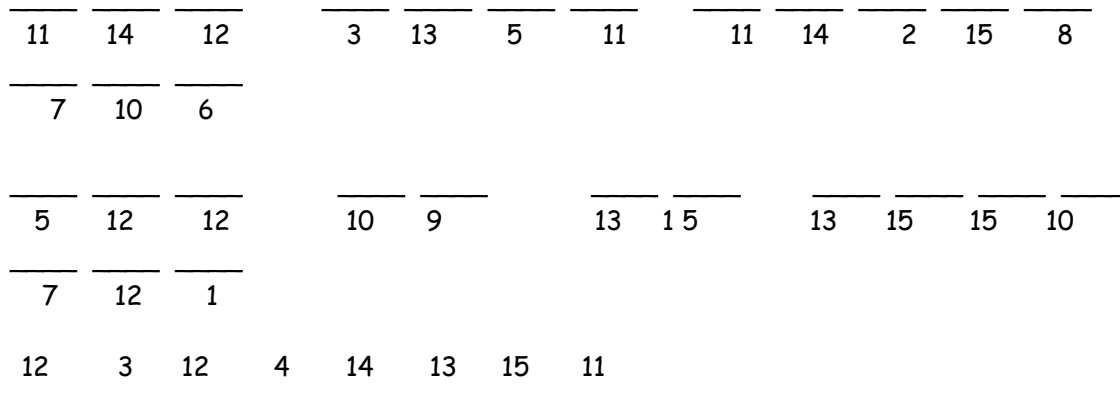
U. -12

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

Y -126

\_\_\_ 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  $f'(-3) = 5$ .

Z. None of the above



Can you determine the Title for this Far Side Doodle?

THE FAR SIDE · GARY LARSON

