FIND THE BINGO (Derivatives: Power formula, Product Rule, Quotient Rule, Chain Rule)
A Puzzle by David Pleacher

Directions: Find the first derivative of each function to the right. Locate the derivative on the BINGO board below. Circle the answer. Keep working problems in any order until you have five circled answers in a line horizontally, vertically, or diagonally.

WHEN YOU FIND THE BINGO, YOUR WORK IS FINISHED!

$2x-2x^{-3}$ ✓	$\frac{19}{3x-2}$	$10x\left(x^2+1\right)^4$ ✓	$-(2+2x^3)$	$(x+1)^{-2}$
$3(x^2+3x)^2$	$5x^4-2x$ ✓	$2x(3x^2)$	$8x+12$ ✓	$8x^3+16x$ ✓
✓ $3x^2-8x-3$	$2x+x^{-2}$	$\frac{-4x}{(x^2-1)^2}$ ✓	$12x-7$	$\frac{(2-6x^2)}{(3x^2+1)^2}$ ✓
$15(x^2-x^4)$ ✓	$3x^2-6x$ ✓	$2x(1-x^2)^{-2}$	$\frac{-19}{(3x-2)^2}$ ✓	$\frac{4x}{(x^2+1)^2}$
$12x+13$ ✓	$\frac{1-x^2}{(x^2+1)^2}$ ✓	$2x+1$ ✓	$2(x+\frac{1}{x})$	$\frac{1}{\sqrt{2x+1}}$ ✓

1. $y=(x^2+1)^5$
2. $y=(3x-1)(2x+5)$
3. $y=\sqrt{2x+1}$
4. $y=x^3-3x^2+2$
5. $y=\dfrac{2x+5}{3x-2}$
6. $y=(2x^2+2)(x^2+3)$
7. $y=(x-2)(x+3)$
8. $y=\dfrac{x^2+1}{x^2-1}$
9. $y=x^3-4x^2-3x$
10. $y=5x^3-3x^5$
11. $y=(2x+3)^2$
12. $y=(x+x^{-1})^2$
13. $y=x^2(x^3-1)$
14. $y=\dfrac{2x}{3x^2+1}$
15. $y=\dfrac{x}{x^2+1}$

Many thanks to Kathy Rivers for retyping this puzzle!

Derivative Bingo:

1) $y = (x^2+1)^5$

$y' = 5(x^2+1)^4 \cdot 2x = 10x(x^2+1)^4$

2) $y = (3x-1)(2x+5) = 6x^2 + 13x - 5$

$y' = 12x + 13$

3) $y = (2x+1)^{1/2}$

$y' = \frac{1}{2}(2x+1)^{-1/2} \cdot 2 = \frac{1}{\sqrt{2x+1}}$

4) $y = x^3 - 3x^2 + 2$

$y' = 3x^2 - 6x$

5) $y = \frac{2x+5}{3x-2}$

$y' = \frac{(3x-2)(2) - (2x+5)(3)}{(3x-2)^2}$

$y' = \frac{6x - 4 - 6x - 15}{(3x-2)^2} = \frac{-19}{(3x-2)^2}$

6) $y = (2x^2+2)(x^2+3)$

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

$y' = 8x^3 + 16x$

7) $y=(x-2)(x+3)$

$y=x^2+x-6$

$y'=2x+1$

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

$y'=\dfrac{(x^2-1)(2x)-(x^2+1)(2x)}{(x^2-1)^2}$

$y'=\dfrac{2x^3-2x-2x^3-2x}{(x^2-1)^2}$

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

9) $y=x^3-4x^2-3x$

$y'=3x^2-8x-3$

10) $y=5x^3-3x^5$

$y'=15x^2-15x^4$

$y'=15(x^2-x^4)$

11) $y=(2x+3)^2$

$y'=2(2x+3)\cdot 2$

$=4(2x+3)$

$=8x+12$

12) $y=(x+x^{-1})^2$

$y'=2(x+x^{-1})\cdot(1-x^{-2})$

$y'=2(x+\frac{1}{x})\cdot(1-\frac{1}{x^2})$

$2(x-\cancel{\frac{1}{x}}+\cancel{\frac{1}{x}}-\frac{1}{x^3})$

$=2x-2x^{-3}$

13) $y=x^2(x^3-1)$

$y=x^5-x^2$

$y'=5x^4-2x$

14) $y=\dfrac{2x}{3x^2+1}$

$y'=\dfrac{(3x^2+1)2-(2x)(6x)}{(3x^2+1)^2}$

$y'=\dfrac{6x^2+2-12x^2}{(3x^2+1)^2}=\dfrac{-6x^2+2}{(3x^2+1)^2}$

15) $y=\dfrac{x}{x^2+1}$

$y'=\dfrac{(x^2+1)(1)-x(2x)}{(x^2+1)^2}=\dfrac{x^2+1-2x^2}{(x^2+1)^2}$

$\dfrac{-x^2+1}{(x^2+1)^2}$

Scanned by CamScanner