Name: _____
Date: _____ **Period:** _____ **Score:** _____

Find the derivative of the function.

1) $f(x) = 7x - 5$

$f'(x) = 7$

2) $g(x) = 1 - 2x - x^2$

$g'(x) = -2 - 2x$

3) $f(x) = x^3 - 3x^2 + 5x - 2$

$f'(x) = 3x^2 - 6x + 5$

4) $f(x) = \frac{1}{8}x^8 - x^4$

$f'(x) = x^7 - 4x^3$

5) $F(t) = \frac{1}{4}t^4 - \frac{1}{2}t^2$

$F'(t) = t^3 - t$

6) $v(r) = \frac{4}{3}\pi r^3$

$V'(r) = 4\pi r^2$

7) $G(y) = y^{10} + 7y^5 - y^3 + 1$

$G'(y) = 10y^9 + 35y^4 - 3y^2$

8) $F(x) = x^2 + 3x + \frac{1}{x^2}$ x^{-2}

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

9) $g(x) = 4x^4 - \frac{1}{4}x^4$

$g'(x) = 16x^3 - x^3 = \boxed{15x^3}$

10) $g(x) = \frac{3}{x^2} + \frac{5}{x^4}$ $g(x) = 3x^{-2} + 5x^{-4}$

$g'(x) = -6x^{-3} - 20x^{-5} = \boxed{\frac{-6}{x^3} - \frac{20}{x^5}}$

11) $f(s) = \sqrt{3}(s^3 - s^2)$ $f(s) = \sqrt{3}s^3 - \sqrt{3}s^2$

$\boxed{f'(s) = 3\sqrt{3}s^2 - 2\sqrt{3}s}$

12) $f(x) = (2x^4 - 1)(5x^3 + 6x)$

$f'(x) = (2x^4 - 1)(15x^2 + 6) + (5x^3 + 6x)(8x^3)$

13) $G(y) = (7 - 3y^3)^2$ $G(y) = (7-3y^3)(7-3y^3) = 49 - 42y^3 + 9y^6$

$G'(y) = -126y^2 + 54y^5$

14) $D_x[(x^2 - 3x + 2)(2x^3 + 1)]$

$D'(x) = (x^2-3x+2)\cdot 6x^2 + (2x^3+1)(2x-3)$

15) $D_x\left(\frac{x}{x-1}\right)$

$D'(x) = \frac{(x-1) - x}{(x-1)^2} = \frac{-1}{(x-1)^2}$

16) $\frac{d}{dx}\left(\frac{x^2+2x+1}{x^2-2x+1}\right)$

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

17) $\frac{d}{d_t}\left(\frac{5t}{1-2t^2}\right)$

$d'(x) = \frac{5(1-2t^2) - 5t(-4t)}{(1-2t^2)^2} = \frac{5(1-2t^2)+20t^2}{(1-2t^2)^2}$ or $\frac{5+10t^2}{(1-2t^2)^2}$