

Worksheet 8 - Derivatives III

Period _____

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

1) $f = s^3 - 2s^2 + 1$ at $(-1, -2)$

2) $g = -\frac{2}{x+3}$ at $\left(1, -\frac{1}{2}\right)$

3) $g = -\frac{x^2}{2} + 3x - \frac{13}{2}$ at $\left(0, -\frac{13}{2}\right)$

For each problem, find the indicated derivative with respect to the given variable.

4) $t = -2r^3 + 2r$ Find $\frac{d^3t}{dr^3}$

5) $y = -2t^5 + t^2$ Find $\frac{d^3y}{dt^3}$

6) $g = -5x^5 - 4x^4$ Find $\frac{d^3g}{dx^3}$

For each problem, use implicit differentiation to find $\frac{dy}{dx}$ in terms of x and y .

7) $3x^3 = y^2 + 3$

8) $3x^2 - 5y^2 = 1$

9) $x = 3x^2y^2 + 2$

10) $2 = 2x^3 - 4y^3$

11) $2x^3 - y^2 = 3xy^2$

Differentiate each function with respect to the given variable.

$$12) y = 3s^{\frac{4}{5}}$$

$$13) h = -s^{\frac{1}{3}}$$

$$14) r = -2x^{-5}$$

$$15) y = \left(-5 - \frac{3}{x^2}\right)(5x^5 - 1)$$

$$16) t = (-2\sqrt[5]{r} + 5)(-2r^2 - 1)$$

$$17) g = (5 + 2x^{-4})(x^2 - 4)$$

$$18) f = \left(-r^{\frac{3}{5}} + 4\right)(-5r^3 - 5)$$

$$19) y = (-4\sqrt[4]{s} + 2)(-4s^2 + 4)$$