

Practice Worksheet

Tangent to a Curve

Find the derivative of each function.

1. $f(x) = 1.2x^4 - 3.5x^3 + 2.4x$

$f' = 4.8x^3 - 10.5x^2 + 2.4$

2. $f(x) = 3x^{-3} - 5x^{-2} - 4x$

$f' = -9x^{-4} + 10x^{-3} - 4$
 $f' = -9/x^4 + 10/x^3 - 4$

3. $f(x) = \frac{2}{x^5} - \frac{5}{x^2}$

$f' = -10x^{-6} + 10x^{-3}$
 $f' = -10/x^6 + 10/x^3$

4. $f(x) = \frac{1}{3}x^3 + \frac{1}{2}x^2 + 3$

$f' = x^2 + x$

Find the slope of the line tangent to the graph of each function at the given point.

5. $y = 3x^2, (1, 3)$

$y' = 6x \Rightarrow 6(1)$

$y'(1) = 6$

6. $y = \frac{1}{2}x^2 - 4, (2, -2)$

$y' = \frac{2x}{2} \Rightarrow 2$

$y'(2) = 2$

7. $y = \frac{4x^3 - 7}{2}, (1, 0)$

$y' = \frac{12x^2}{2} \Rightarrow 6$

$y'(1) = 6$

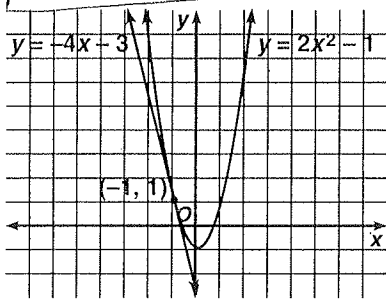
Find the equation of the line tangent to the graph of each function at the given point. Write the equation in slope-intercept form.

Graph the function and the tangent.

8. $y = 2x^2 - 1, (-1, 1)$

$y = -4x - 3$

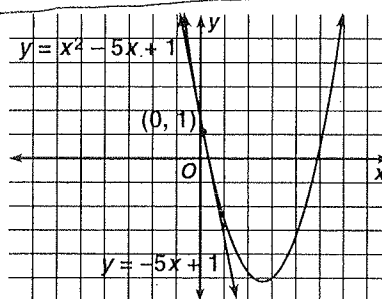
$y' = 4x$
 $y'(-1) = -4 = \text{slope at } -1$
 $y - 1 = -4(x + 1)$
 $y = -4x - 3$



9. $y = x^2 - 5x + 1, (0, 1)$

$y = -5x + 1$

$y' = 2x - 5$
 $y'(0) = -5 = \text{slope at } 0$
 $y - 1 = -5x$
 $y = -5x + 1$



10. Find the coordinates of the point(s) at which the line tangent to the graph of $f(x) = x^2 - 1$ has slope -2.

$(-1, 0)$

$f'(x) = 2x$

HAS A SLOPE -2 WHEN $2x = -2$
 $x = -1$

$f(-1) = 1^2 - 1 = 0$

Should be $f(-1) = (-1)^2 - 1 = 0$ $(-1, f(-1)) = (-1, 0)$