

Name Key Date _____ Block _____

Find Someone Who: Derivatives

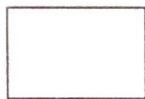
Find a different classmate to find each of the following derivatives:

Once your classmate completed the problem, make sure he or she **BOX** the answer and initial the signature **box**. Make sure to check over your classmate's work before and that you agree with the answer **before** submitting your paper.

<p>1. $y = 3x^3 - 6x + 1$</p> <p>$y' = 9x^2 - 6$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>	<p>2. $y = 4x^9 - 2x^2 + 8x$</p> <p>$y' = 36x^8 - 4x + 8$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>
<p>3. $y = \frac{x^3}{4} + \frac{x^2}{3}$</p> <p>$y' = \frac{3}{4}x^2 + \frac{2}{3}x$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>	<p>4. $y = \frac{2}{x^4} + \frac{8}{x^2}$</p> <p>$y = 2x^{-4} + 8x^{-2}$</p> <p>$y' = -8x^{-5} - 16x^{-3}$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>
<p>5. $y = (2x + 7)(x^3 - 4)$</p> <p>$y' = (2x + 7)(3x^2) + (x^3 - 4)(2)$</p> <p>$y' = 6x^3 + 21x^2 + 2x^3 - 8$</p> <p>$8x^3 + 21x^2 - 8$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>	<p>6. $y = (x^4 - 3x)(x^2 + x)$</p> <p>$y' = (x^4 - 3x)(2x + 1) + (x^2 + x)(4x^3 - 3)$</p> <p>$= 2x^5 - 6x^2 + x^4 - 3x + 4x^5 + 4x^4 - 3x^2 - 3x$</p> <p>$= 6x^5 + 5x^4 - 9x^2 - 6x$</p> <div style="text-align: right; border: 1px solid black; width: 80px; height: 40px; margin-left: auto;"></div>

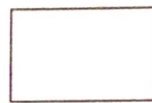
$$7. \quad y = \frac{4x^2 - 9}{8x + 10}$$

$$\begin{aligned} y' &= \frac{(8x+10)(8x) - (4x^2-9)(8)}{(8x+10)^2} \\ &= \frac{64x^2 + 80x - 32x^2 + 72}{(8x+10)^2} \\ &= \frac{32x^2 + 80x + 72}{(8x+10)^2} \end{aligned}$$



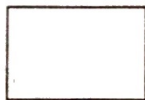
$$8. \quad y = \frac{5x^4 + 2x}{x^3 - 7}$$

$$\begin{aligned} y' &= \frac{(x^3-7)(20x^3+2) - (5x^4+2x)(3x^2)}{(x^3-7)^2} \\ &= \frac{20x^6 - 140x^3 + 2x^3 - 14 - 15x^6 - 6x^3}{(x^3-7)^2} \\ &= \frac{5x^6 - 144x^3 - 14}{(x^3-7)^2} \end{aligned}$$



$$9. \quad \text{Find } y'''(7). \\ y = x^5 - 2x^4 + 3x^2$$

$$\begin{aligned} y' &= 5x^4 - 8x^3 + 6x \\ y'' &= 20x^3 - 24x^2 + 6 \\ y''' &= 60x^2 - 48x \\ y'''(7) &= 60(7)^2 - 48(7) \\ &= 2604 \end{aligned}$$



$$10. \quad \text{Find } \frac{d^2P}{dt^2}.$$

$$P = t^3 - 9t^2 + t - 1 - \frac{1}{t}$$

$$\begin{aligned} \frac{dP}{dt} &= 3t^2 - 18t + 1 + t^{-2} \\ \frac{d^2P}{dt^2} &= 6t - 18 - \frac{2}{t^3} \end{aligned}$$

