Name_____

Derivatives of Inverse Functions

Date_____ Period_____

For each problem, find $(f^{-1})'(x)$ by direct computation.

1) $f(x) = -3x + 3$

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

For each problem, find $(f^{-1})'(x)$ by using the theorem $(f^{-1})'(x) = \dfrac{1}{f'(f^{-1}(x))}$

3) $f(x) = -5x + 1$

4) $f(x) = -2x + 2$

5) $f(x) = \sqrt{-2x - 3}$

6) $f(x) = -4x^3 - 4$

For each problem, find $(f^{-1})'(x)$ by using the formula $\dfrac{dy}{dx} = \dfrac{1}{\dfrac{dx}{dy}}$, where $y = f^{-1}(x)$

7) $f(x) = x^7 + x - 3$

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

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For each problem, find $\left(f^{-1}\right)'(x)$ by direct computation.

1) $f(x) = -3x + 3$

$\left(f^{-1}\right)'(x) = -\dfrac{1}{3}$

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

$\left(f^{-1}\right)'(x) = -\dfrac{1}{2}$

For each problem, find $\left(f^{-1}\right)'(x)$ by using the theorem $\left(f^{-1}\right)'(x) = \dfrac{1}{f'\left(f^{-1}(x)\right)}$

3) $f(x) = -5x + 1$

$\left(f^{-1}\right)'(x) = -\dfrac{1}{5}$

4) $f(x) = -2x + 2$

$\left(f^{-1}\right)'(x) = -\dfrac{1}{2}$

5) $f(x) = \sqrt{-2x - 3}$

$\left(f^{-1}\right)'(x) = -\dfrac{2x}{2}$

6) $f(x) = -4x^3 - 4$

$\left(f^{-1}\right)'(x) = -\dfrac{1}{12 \cdot \left(\dfrac{-x-4}{4}\right)^{\frac{2}{3}}}$

For each problem, find $\left(f^{-1}\right)'(x)$ by using the formula $\dfrac{dy}{dx} = \dfrac{1}{\dfrac{dx}{dy}}$, where $y = f^{-1}(x)$

7) $f(x) = x^7 + x - 3$

$\left(f^{-1}\right)'(x) = \dfrac{1}{7y^6 + 1}$

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

$\left(f^{-1}\right)'(x) = \dfrac{1}{15y^4 + 2}$

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