Name: _____ Date: _____ Pd. ____ 2016

AP Calculus – Derivatives of Inverse Functions

1. Find $\left.\frac{df^{-1}}{dx}\right|_4$, given $f(x)=x^3+3x$

2. Find $\left.\frac{dg^{-1}}{dx}\right|_3$, given $g(x)=\sqrt{1-x^3}$

3. Find $\left.\frac{dh^{-1}}{dx}\right|_3$, given $h(x)=3e^{-x}+5\ln(1+x)$

4. Find $\left.\frac{dk^{-1}}{dx}\right|_{-5}$, given $k(x)=\sin\left(\frac{\pi}{x}\right)+\cos\left(\frac{2\pi}{x}\right)-\frac{x^4}{216}$

5. Find $\left.\frac{d}{dx}\left[f^{-1}(x)\cdot g(x)\right]\right|_2$, given $f(x)=3x^{-1}+\ln\left(-\frac{1}{x}\right)-5x$ and $g(x)=\frac{\sin(x+1)}{2}+\sqrt{x+5}$

6. Find $\left.\frac{d}{dx}\left[\frac{g^{-1}(x)}{f^{-1}(x)}\right]\right|_2$, given $f(x)=3x^{-1}+\ln\left(-\frac{1}{x}\right)-5x$ and $g(x)=\frac{\sin(x+1)}{2}+\sqrt{x+5}$

Use the table given below, that contains selected values from the functions $f(x)$, $g(x)$, $h(x)$, and $k(x)$ to answer the following questions.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$	$h(x)$	$h'(x)$	$k(x)$	$k'(x)$
-2	-2	6	$-\frac{\sqrt{3}}{3}$	$-\frac{4\pi}{27}$	6	-7	$-\sqrt{3}$	$-\frac{\pi}{12}$
-1	1.75	1.75	$-\sqrt{3}$	$-\pi$	0	-5	-3.25	1.25
0	2	-1	$\frac{\sqrt{3}}{3}$	$-\frac{4\pi}{3}$	-4	-3	-2	1
2	-2	-2	$\frac{\sqrt{3}}{3}$	$-\frac{4\pi}{3}$	-6	1	$-\sqrt{3}$	$\frac{\pi}{12}$
3	-3.25	-.25	$-\sqrt{3}$	$-\pi$	-4	3	1.75	1.25
6	14	14	2.246	-0.759	14	9	0	$\frac{\pi}{6}$

7. $\left.\frac{df^{-1}}{dx}\right|_{2}$

8. $\left.\frac{dg^{-1}}{dx}\right|_{-\sqrt{3}}$

9. $\left.\frac{dh^{-1}}{dx}\right|_{6}$

10. $\left.\frac{dk^{-1}}{dx}\right|_{0}$

11. Let $p(x)=f^{-1}(x)$, find $p'(-2)$

12. Let $w(x)=f(x)\cdot g(x)$, find $w'(3)$

13. Let $m(x)=f(x)\cdot k^{-1}(x)$, find $m'(-2)$

14. Find the tangent line to $h(x)$ when $x=6$.

15. Let $b(x)=h^{-1}(x)$, find the tangent line to $b(x)$ when $x=6$.