1. [8 points] The table below gives several values of the continuous, invertible, differentiable functions $f(x)$ and $g(x)$.

x	1.8	1.9	2	2.1	2.2	2.3
$f(x)$	2.5	2.35	2.2	2	1.8	1.7
$g(x)$	1.6	1.75	1.8	1.9	2	2.2

a. [2 points] Compute $f(g^{-1}(2))$.

Answer: $f(g^{-1}(2)) =$ ____________________

b. [2 points] Estimate $f'(2)$.

Answer: $f'(2) \approx$ ____________________

c. [2 points] Let $j(x) = g^{-1}(x)$. Estimate $j'(1.9)$.

Answer: $j'(1.9) \approx$ ____________________

d. [2 points] Suppose $p(x)$ is a function whose derivative is given by $p'(x) = \ln(x^3 + 11)$. Compute $p'(f(2))$.

Answer: $p'(f(2)) =$ ____________________

2. [6 points] Suppose a and b are constants with $a > 3$ and $b > 0$, and let $h(t) = a^{-bt}$.

a. [3 points] Find constants P_0 and k so that $h(t) = P_0 e^{kt}$. (Your answers may involve the constants a and/or b.)

Answer: $P_0 =$ ____________________ and $k =$ ____________________

b. [3 points] Circle <u>all</u> the statements below that <u>must</u> be true about the function $h(t)$. If none of the statements must be true, circle NONE OF THESE.

i. The domain of $h(t)$ is the interval $(-\infty, \infty)$.

ii. The range of $h(t)$ is the interval $(-\infty, \infty)$.

iii. $h(t)$ is an increasing function on its domain.

iv. $h(t)$ is concave up on its domain.

v. $t = 0$ is a vertical asymptote of the graph of $h(t)$.

vi. $\lim_{t\to\infty} h(t) = 0$.

vii. $\lim_{t\to-\infty} h(t) = 0$.

NONE OF THESE