Tables, tables, tables *Name:* ______________________

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The table below gives values of the functions and their first derivatives at selected values of x

Let h(x) be the inverse of g and let p(x) be the inverse of f

Find the following values based on the values given in the table

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	-4	3	3	-1
2	1	-2	-1	3
3	5	1	6	-2
4	0	1	4	-3

(a) $h'(-1)$ *(b)* $h'(3)$

(c) $h'(6)$ *(d)* $h'(4)$

(e) $p'(0)$ *(f)* $p'(1)$

(g) $p'(-4)$ *(h)* $p'(5)$

[Based on a problem by D. Ross for Houston ACT]

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As a cauldron full of potion cools, the temperature of the potion is modeled by a differentiable function P for $0 \le t \le 15$,where t is measured in minutes and temperature P is measured in degrees Celsius. Values of $P(t)$ at selected values of time t are shown in the table below.

t (minutes)	0	3	4	5	10	15
$P(t)$ (^{o}C)	90	80	76	72	60	50

(a) Use the data in the table to approximate the rate at which the temperature of the potion is changing at time $t = 4.5$. As always, show all your steps/work.

(b) Using correct units, explain the meaning of $\frac{1}{15}\int_0^{15} P(t)dt$. Use a trapezoidal sum with five subintervals indicated by the table to estimate $\frac{1}{15}\int_0^{15} P(t)dt$.

(c) Evaluate $\int_0^{15} P'(t)dt$. Using correct units , explain the meaning of the expression in the context of this problem.

(d) Find the average rate of change of $P(t)$ for $0 \le t \le 15$. Indicate units.

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A zombie shambles along a straight path near your hiding place. You peek out from your hiding place and note its position at various times and record it in the table below.

t in seconds	*0*	*5*	*8*	*13*	*21*	*30*
s(t) position in feet	*5*	*11*	*8*	-2	*14*	*30*

(a) Find the average velocity of the zombie for the time interval [0, 30]. Include units.

(b) Find the value of $\int_0^{30} v(t)dt$. Interpret its meaning in the context of this problem. Include units.





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Based on the tables below, determine if g is increasing at an increasing or decreasing rate. Determine if h is decreasing at an increasing or decreasing rate. Interpret what this means in terms of the function's first and second derivatives.

x	$g(x)$	😐😐😐😐😐😐😐	x	$h(x)$
3	14	😐😐😐😐😐😐😐	3	26
4	17	😐😐😐😐😐😐😐	4	23
5	20	😐😐😐😐😐😐😐	5	20
6	23	😐😐😐😐😐😐😐	6	17
7	26	😐😐😐😐😐😐😐	7	14

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Let f be a function that is twice differentiable for all real numbers. The table below gives values of f for selected points in the closed interval $3 \le x \le 14$

x	3	4	5	7	14
$f(x)$	3	7	-1	5	11

(a) Estimate $f'(3)$. Show the work that leads to your answer

(b) Use your estimate from part (a) to write the equation of the tangent line to the graph of f at $x = 3$. Use local linearization to find an estimate for $f(3.2)$

(c) Evaluate $\int_3^{14} [5 - 5f'(x)]\, dx$. Show the work that leads to your answer.

(d) Use a right Riemann Sum with the subintervals indicated by the data in the table to approximate $\frac{1}{11}\int_3^{14} f(x)dx$. Explain what this value represents.

(e) Show that there must exist a value, $3 < c < 14$ such that $f'(c) = 0$

(f) Show that there must exist a value $3 < r < 14$ such that $f(r) = 0$

(g) Let $g = f^{-1}$ for all real numbers. Find the value of $g(11)$ and write an equation that could find $g'(11)$ [if we have selected values of f']