

3. (4 points) The functions f and g are defined for all real values of x , and g has an inverse. Although f and g are defined for all real numbers x , we have listed only a partial table of values.

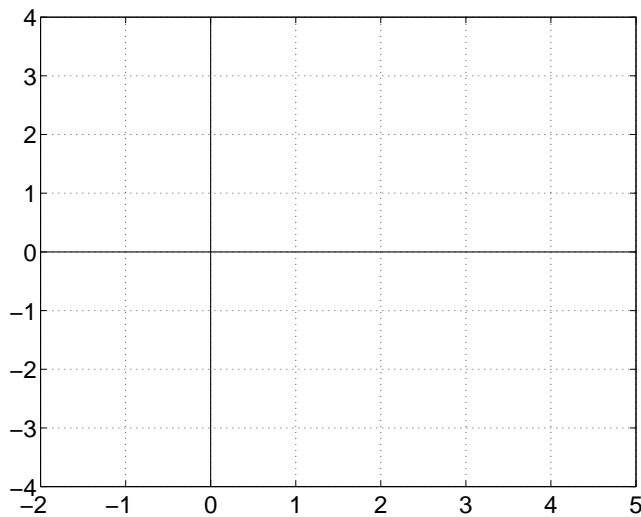
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|--------|----|----|-----|----|----|------|----|----|------|
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| $f(x)$ | 1 | 0 | -5 | 2 | 0 | 2 | 6 | 3 | 1 |
| $g(x)$ | 4 | 2 | 1.5 | 0 | -1 | -1.5 | -2 | -3 | -3.5 |

The following table gives some of the values of g^{-1} and the composition of g and f . Using the data given in the above table, fill in the blanks in the table below. If there is not enough information to determine the exact value, mark an "X" in the box.

| | | | | | | | | | |
|-------------|------|----|----|----|----|----|---|------|------|
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| $g(f(x))$ | -1.5 | -1 | X | | -1 | -2 | | -3 | -1.5 |
| $g^{-1}(x)$ | 5 | 3 | 2 | 0 | -1 | | | -3.5 | -4 |

4. (9 points) You are given that a function f has the properties that $f(1) = 2$, $f'(1) = 3$ and that the average rate of change of f on the interval from $x = 1$ to $x = 3$ is -2 .

(a) Sketch a possible graph of f on the given axes. Be sure that your graph shows clearly what is known about the values of $f(1)$ and $f(3)$.



(b) Give a formula for the tangent line to the graph of f at $x = 1$. Sketch this line on your graph.