Kerry Ojakian's MTH 30 Class
Class Assignment #3

1. Find the domain and zeroes of $g(x) = \frac{4x}{x^2-100}$.

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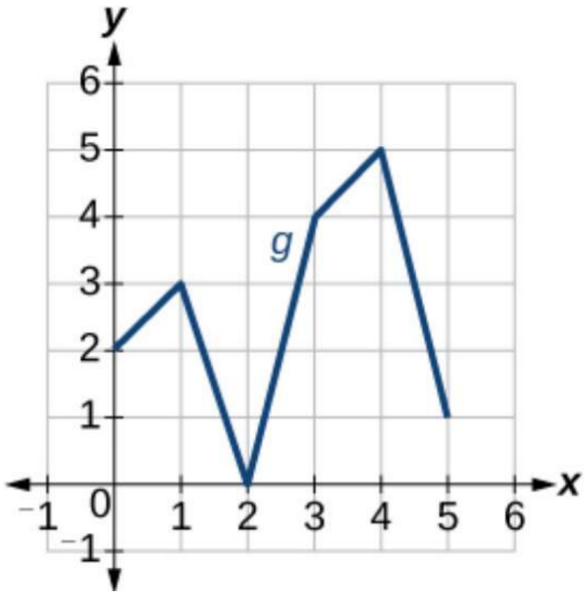
2. Consider the function graphed below.
   (a) Find the intervals where it increases.
   (b) Find the intervals where it decreases.
   (c) Find all local maxima (both x and y coordinates).
   (d) Find all local minima (both x and y coordinates).



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3. Draw the graph of a function whose domain is all reals, and which is decreasing left of 4 and increasing right of 4. Is it possible for such a function to be one-to-one? Explain.

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4. If a function g is increasing on the interval $(1, 7)$ and decreasing on the interval $(7, 10)$ then what can be said about the local extremum of g on $(1, 10)$?

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5. Consider the line $f(x) = 46x - 87$. What are its local extrema? What are its absolute extrema?

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6. Suppose $f(t) = \dfrac{7}{t}$ and $g(t) = \dfrac{7}{t^2}$. Where is each function increasing and where is each function decreasing?

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7. Draw a graph with a local maximum, but no absolute maximum.

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8. Draw a graph with an absolute maximum, but no absolute minimum, which does have a relative minimum.

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9. Draw a graph of a function $f(x)$ with no absolute maximum, but such that $|f(x)| < 10$.

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10. For $h(x) = 5\sqrt{x}$ what are its absolute extrema?

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11. What are the absolute extrema of the graph of $y = x^2 + 1$?

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12. What are the absolute extrema of the graph of $y = -3x^2 + 1$?
