

1. **(15 points)** Answer the following questions about the function $f(x) = x^3 + 3x^2 - 24x$.
- (a) **(5 points)** For which values of x is this function increasing? For which values is it decreasing? Label which is which.
- (b) **(5 points)** Where are this function's extrema? Identify each as a local maximum or a local minimum.
- (c) **(5 points)** Where is the function concave up? Where is it concave down? Where are its points of inflection, if any? Label which is which.
2. **(5 points)** Determine where the function $g(x) = \frac{x^2+3}{x+1}$ is increasing and where it is decreasing. Label which is which.
3. **(2 point bonus)** Can a point of inflection of a function also be an extremum? Why or why not?