Related Rates and Extrema

1. A ladder 13 meters long rests on horizontal ground and leans against a vertical wall. The top of the ladder is being pulled up the wall at 0.1 meters per second. How fast is the foot of the ladder approaching the wall when the foot of the ladder is 5m from the fall?

2. Find all local extrema for the functions (if there are any)

   a. $y = x^3 - 9x^2 + 24x$

   b. $y = \cos 2x - x$

3. Find the location and value of the absolute extreme values of f on the given interval if they exist.

   a. $y = x^4 - 4x^3 + 4x^2$ on $[-1, 3]$

   b. $y = 3x^{2/3} - x$ on $[0, 27]$.