

Math 19: Homework 6

Due: Wednesday, March 4, 9 AM (the start of class)

Instructions: You are responsible for turning in the assigned problems below only. You *do not* have to turn in the practice problems, but you are responsible for knowing how to do them. Assigned problems will be graded both on correctness and the clarity of your explanation. You must put your full name on your homework, and if you use more than one page, your work must be stapled.

Practice Problems: §4.1: 11, 12, 13, 17, 20, 27, 37, 39
§4.3: 7, 8, 10, 13, 16, 19, 20, 22, 23, 24

Assigned Problems:

§4.1, #15: Two cars start moving from the same point. One travels south at 60 mi/h and the other travels west at 25 mi/h. At what rate is the distance between the cars increasing two hours later?

§4.1, #29: Gravel is being dumped from a conveyor belt at a rate of 30 ft³/min, and its coarseness is such that it forms a pile in the shape of a cone whose base diameter and height are always equal. How fast is the height of the pile increasing when it's 10 ft high?

§4.1, #40: A Ferris wheel with a radius of 10 m is rotating at a rate of one revolution every two minutes. How fast is a rider rising when her seat is 16 m above ground level?

§4.3, #9: Let $f(x) = x^4 - 2x^2 + 3$.

- Find the intervals on which $f(x)$ is increasing or decreasing.
- Find the local maximum and minimum values of f .
- Find the intervals of concavity and the inflection points.

§4.3, #21: Let $f(x) = 2x^3 - 3x^2 - 12x$.

- Find the intervals on which $f(x)$ is increasing or decreasing.
- Find the local maximum and minimum values of f .
- Find the intervals of concavity and the inflection points.
- Using the information from parts **a.-c.**, sketch the graph of $f(x)$.