

Honors Analysis

Name _____

Copy original problem.

Per _____

Date _____

Convince *me* that **you** understand the concept!

No Calculators!

Chapter 2 Exam

I Solve for all x (including complex values, if any). Show ERRTS at work.
Rewrite the equation in “factored form”.

(15 pts ea)

a) $12x^4 - 55x^3 + 45x^2 + 40x - 12 = 0$

b) $45x^4 - 102x^3 + 17x^2 + 16x - 4 = 0$

II Parabolas

(15 pts ea)

a) Given the focus $(4, 2)$ and the directrix $y = 3$, determine the equation of the parabola and write in the form of $ax^2 + bx + cy + d = 0$ where the letters $a, b, c,$ and d are integers and $a > 0$. Be *very* sure you justify your method.

b) Given $y = \frac{1}{8}x^2 - \frac{3}{4}x - \frac{7}{8}$. Using the method of “completing the square,” determine the coordinates of the vertex and the focus as well as the equation of the directrix. Determine the coordinates of *all* axis intercepts.

III Given: a line passing through $(4, 3)$ and $(14, -12)$.

Find the equation of the perpendicular line which has the same x -intercept.

(10 pts)

IV Application problems

(30 pts total)

a) Two hundred forty feet of fencing are to be used to enclose a rectangular plot of ground and to separate it into two parts by means of a fence parallel to one of its sides. What are the dimensions which will yield that maximum area?

b) Find three consecutive integers such that the sum of the squares of the first and third numbers is a minimum.

c) **Explain** how you know that you have the absolute maximum in part A and the absolute minimum in part B. **Explain** how your methods for solution to part A differed from your methods for solution for part B **and why**.

Extra Credit ----- 5 pts -----

The Czarina of Jakestan has decreed that the citizens pay numerically the same percent in income tax as they make in rupees per week. What is the optimal salary in Jakestan?