

PRACTICE EXAM 2 - MATH 140

DATE: Wednesday, February 16

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the radical equation $\sqrt{3 - x + x^2} = x - 2$.
2. Solve the absolute value inequality $|x^2 - 2x| \leq 3$.
3. Use your knowledge of graphing techniques and of piece-wise defined functions to graph the piece-wise defined function

$$f(x) = \begin{cases} (x + 2)^3, & \text{if } x \leq -1 \\ -x, & \text{if } -1 < x \leq 1 \\ -x^2 + 1, & \text{if } x > 1 \end{cases}$$

4. Perform the following steps in the order given: Find the intercepts, create the sign table and roughly sketch the graph of the polynomial function $f(x) = x^2(x + 2)(x - 3)$.
5. Perform the following steps in the order given: Find the domain, the intercepts, create the sign table, find the asymptotes and roughly sketch the graph of the rational function

$$f(x) = \frac{x(x - 1)^2}{(x + 3)^3}.$$

6. Solve the rational inequality $\frac{x(x^2+1)(x-2)}{(x-1)(x+1)} \geq 0$.