

## PRACTICE EXAM 2 - MATH 140

DATE: Friday, October 7

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. (a) Solve the radical equation  $\sqrt{2x-1} - \sqrt{x-5} = 3$ .  
(b) Solve the absolute value inequality  $1 - \left|\frac{2x-1}{3}\right| > -2$ .
2. Starting from the graph of the function  $f(x) = \sqrt{x}$ , perform all necessary transformations to graph the function  $g(x) = 3\sqrt{x-2} - 5$ . (Show me clearly all the step-by-step transformations involved and produce the accompanying intermediate graphs carefully.)
3. Two cars are approaching an intersection. One is 2 miles south of the intersection and is moving at a constant speed of 30 miles an hour. At the same time, the other car is 3 miles east of the intersection and is moving at a constant speed of 40 miles per hour. Express the distance  $d$  between the two cars as a function of time  $t$ .
4. Find the intercepts, produce the sign table and then roughly sketch the graph of the polynomial function  $f(x) = -x^2(x^2 - 4)(5 - x)$ .
5. Find the domain, the intercepts, the asymptotes, produce the sign table and then roughly sketch the graph of the rational function  $f(x) = \frac{x^2-2x}{x^2-9}$ .
6. (a) Solve the polynomial inequality  $x^4 - 5x^2 + 4 > 0$   
(b) Solve the rational inequality  $\frac{x(x^2+x-2)}{x^2+9x+20} \leq 0$ .