

You have 1 hour to complete the exam. Full credit will be given for correct answers with complete explanations. Give exact answers whenever possible, otherwise give answers accurate to two decimal places.

1. (10 pts) Find a solution to the equation:

$$x - 3 = -\sqrt{5 - x}.$$

2. (5 pts) Can the following table possibly be a table of values of a function? Answer YES or NO.

Input	0	-2	1	3	0
Output	1	0	2	1	0

3. (10 pts) Find the domain of the function

$$f(x) = \sqrt{x^2 - 9}.$$

4. (15 pts) For the function  $y = -x^3 + 4x^2 + 2x - 5$ , find:

- (a) a zero of the function in the interval  $(-2, -1)$ ,
- (b) all local minima,
- (c) the interval where the function is increasing.

5. (15 pts) Write the rule of a function  $g(x)$  obtained by performing the following transformations on  $f(x) = x^3 + 1$ : shift horizontally 4 units to the right, stretch vertically by a factor of 2, and reflect across the  $x$ -axis.

6. (15 pts) Let  $f(x) = -x^2 + 1$  and  $g(x) = \sqrt{x}$ . Find the composite function  $(f \circ g)(x)$  and the domain of  $f \circ g$ .

7. (15 pts) Find the inverse of the function  $f(x) = \frac{1 + 3x}{2x - 5}$ .

8. (15 pts) A calculator is on sale for 20% less than the list price. The sale price, plus a 5% shipping charge, totals \$105. What is the list price?