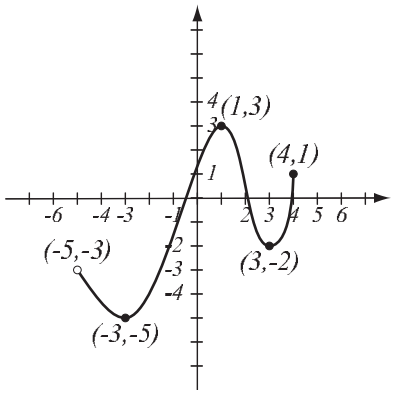
College Algebra — Exam 1
MAT 140C, Spring 2025 — D. Ivanšić

Name: _____

Show all your work!

1. (8pts) Use the graph of the function f at right to answer the following questions.



a) Find: $f(-3) =$ $f(5) =$

b) What is the domain of f?

c) What is the range of f?

d) What are the solutions of the equation $f(x) = 2$?

2. (12pts) Use your calculator to accurately sketch the graph of $f(x) = x^2 - 2x\sqrt{x+2} - 1$.

a) Draw the graph on paper and indicate units on the axes.

b) Find all the $x-$ and $y-$intercepts (accuracy: 6 decimal points).

c) Determine the domain of the function in interval notation either algebraically or by looking at the graph.

3. (6pts) Find the equation of the line (in form $y = mx + b$) with x-intercept -2 and y-intercept 4. Draw the requested line.

4. (10pts) Find the equation of the line (in form $y = mx + b$) that is perpendicular to the line $2x - 3y = 12$ and contains the point $(2, -3)$. Draw both lines.

5. (9pts) In a coordinate system, draw the quadrangle with vertices
$A = (-1, 0)$, $B = (1, -1)$, $C = (5, 1)$ and $D = (3, 2)$.
a) Compute the slopes of all sides.
b) Use slopes to determine if the quadrangle is a parallelogram (two pairs of sides parallel).

6. (10pts) Let $f(x) = x^2 + 2x - \sqrt{x}$. Find the following (simplify where appropriate).

$f(9) =$ $f(-3) =$

$f(u^2) =$ $f(a + 3) =$

7. (6pts) Find the domain of the function below and write it using interval notation.

$$f(x) = \frac{3x + 2}{x^2 + 4x - 5}$$

8. (5pts) Solve and write the solution in interval notation.

$1 < 2x - 5 \leq 8$

9. (8pts) A circle is centered at $(-1, 2)$ and passes through $(1, 3)$.
a) Find the equation of the circle.
b) Draw the circle in the coordinate plane.

10. (12pts) At a county fair, you can pay for rides in one of two ways:
A) \$5 flat fee plus \$1.50 per ride.
B) \$15 flat fee that includes 5 rides, and then \$1 per ride for rides beyond 5.
Assuming a child plans to go on at least 5 rides, for which number of rides is plan B better? Solve as an inequality.

11. (14pts) You drive to Cadiz on the highway at 67mph. On the way back, you take the scenic road, driving 55mph. This road is 20 miles longer and takes a half hour longer to drive.
a) How long did it take you to drive to Cadiz?
b) How long is the scenic road?

Bonus (10pts) Antonia will invest some money into accounts bearing 4% and 5% interest. She invests \$750 more in the account bearing 5% interest and finds that her total interest over 1 year is \$244.50. How much is invested in each account?