College Algebra — Exam 1
MAT 140, Fall 2012 — D. Ivanšić

Name: _____

Show all your work!

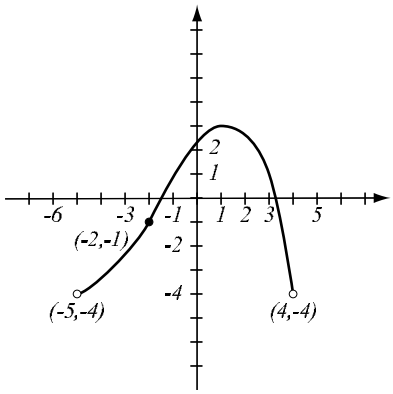
1. (8pts) Use the graph of the function f at right to answer the following questions.

a) Find $f(-2)$ and $f(0)$.

b) What is the domain of f?

c) What is the range of f?

d) What are the solutions of the equation $f(x) = 1$?



2. (10pts) Use your calculator to accurately sketch the graph of $y = x^4 - 8x^2 - 11$. Draw the graph here, and indicate units on the axes. Find all the $x-$ and $y-$intercepts (accuracy: 6 decimal points).

3. (4pts) Convert to scientific notation or a decimal number:

$27,110 =$ $3.159 \times 10^{-5} =$

Use formulas to expand:

4. (4pts) $(3x - 2)^2 =$

5. (4pts) $(x^2 - y)(x^2 + y) =$

6. (6pts) $(x + 5)^3 =$

Simplify, showing intermediate steps.

7. (2pts) $\sqrt{63} =$

8. (5pts) $\sqrt[3]{40x^4} =$

9. (7pts) $\dfrac{\sqrt[4]{324x^5y^{11}}}{\sqrt[4]{2xy^2}} =$

10. (8pts) Simplify.

$$\frac{2x-1}{x^2-49} - \frac{4}{x^2+4x-21} =$$

11. (8pts) Simplify. Express answers first in terms of positive exponents, then convert to root notation.

$$\frac{(64x^{-2}y^6)^{\frac{2}{3}}}{\left(2x^{-\frac{3}{5}}y^5\right)^4} =$$

12. (6pts) Rationalize the denominator.

$$\frac{4\sqrt{2}-5}{3-\sqrt{2}}$$

13. (4pts) Solve the equation for y.

$2x + 3y = c$

14. (8pts) Solve the equation.

$3x^2 + 5x = 6 - x^2$

15. (4pts) Find the domain of the function $f(x) = \dfrac{|x-7|}{x+4}$.

16. (12pts) The circle whose diameter has endpoints $(5, 1)$ and $(-1, -1)$ is given.
a) Find the equation of the circle.
b) Draw the circle in the coordinate plane.
c) Is this circle the graph of a function? Why or why not?

Bonus (10pts) Simplify.

$$\frac{3 + \dfrac{18x^2 - 4x}{x^3 - 8}}{1 + \dfrac{10x + 44}{x^2 + 2x - 8}} =$$