College Algebra — Exam 1
MAT 140, Fall 2014 — D. Ivanšić

Name: _____

Show all your work!

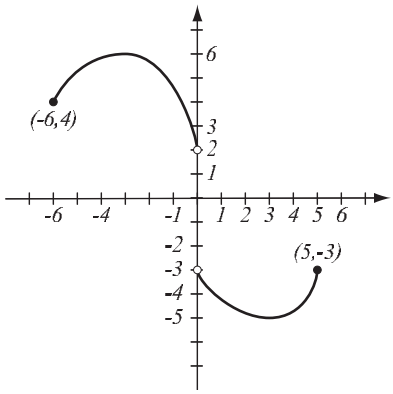
1. (8pts) Use the graph of the function f at right to answer the following questions.

a) Find $f(3)$ 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 $f(x) = 4$?



2. (10pts) Use your calculator to accurately sketch the graph of $y = x^3 - 10x - 17$. 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:

$0.0000347 =$ $1.593 \times 10^4 =$

Use formulas to expand:

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

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

6. (6pts) Factor: $8x^3 - 125 =$

Simplify, showing intermediate steps. Assume variables can be any real numbers.

7. (2pts) $\sqrt[3]{108} =$

8. (5pts) $\sqrt{125x^7y^4} =$

9. (8pts) Simplify.

$$\frac{x-5}{3x^2-x-10} - \frac{2x}{x^2+3x-10} =$$

10. (8pts) Simplify. Express answers first in terms of positive exponents, then convert to radical notation.

$$\frac{\left(x^3y^{-\frac{1}{2}}\right)^{\frac{3}{4}}}{\left(x^{\frac{2}{3}}y^4\right)^{\frac{1}{4}}} =$$

11. (6pts) Rationalize the denominator.

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

12. (5pts) Solve the equation for t.

$c(a + bt) = d$

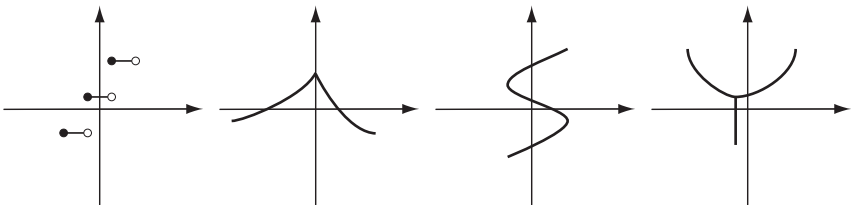
13. (8pts) Find the domain of the function $f(x) = \dfrac{1 + \sqrt{x}}{x^2 + 2x - 8}$ and write it using interval notation.

14. (10pts) Let $g(x) = (x^2 + 2)\sqrt{3 - x}$. Find the following (simplify where appropriate).

$g(-1)$ $g(8)$

$g(\sqrt{a})$ $g(x - 1)$

15. (4pts) Which of the following graphs are graphs of functions (yes/no)?



16. (8pts) A circle is centered at $(-3, 4)$ and passes through the origin.
a) Find the equation of the circle.
b) Draw the circle in the coordinate plane.

Bonus (10pts) Find points on the x-axis whose distance to point $(3, 2)$ is $\sqrt{29}$. *Hint: what form do coordinates of points on the x-axis have?*