

Name: _____

Math 111, Intro to Math Methods and Applications – Crawford

Exam 1

18 September 2013

Score

1	/2
2	/6
3	/24
4	/4
5	/16
6	/6
7	/12
8	/28
9	/4
Total	/102

- No calculators, books, or notes (in any form) allowed.
- Clearly indicate your answers.
- *Show all your work* – partial credit may be given for written work.
- Good Luck!

1. (2 pts). Given the number $\frac{6}{2}$, circle all of the following that describe the number.

real

irrational

rational

natural

integer

2. (6 pts). Sketch the following intervals on the number line **and** write the answer in interval notation.

(a). $4 \leq x < \infty$

(b). $(-2, 6) \cap (3, 8]$

3. (24 pts). Evaluate the following. Simplify and reduce fractions, when possible.

(a). $\frac{4(-3)}{(-2)(-5)}$

(b). $\frac{5 - 3 \cdot 2}{10 - (-2)^3}$

(c). $\frac{(6 - 2) - (8 - (4 - 2))}{(3 - 1)^2}$

(d). $\frac{1}{3} + \frac{3}{4} - 3$

(e). $-\frac{3}{8} \div \frac{5}{2}$

(f). $\frac{2}{3} \cdot \frac{5}{2} \cdot \frac{1}{6}$

(g). $\frac{-2^{-2}2^4}{2^5}$

(h). $2 \cdot |2 - 5| - |-10|$

4. (4 pts). Evaluate the following powers and roots. If it is not a real number, clearly state so.

(a). $\sqrt[4]{-16}$

(b). $4^{3/2}$

5. (16 pts). Simplify the following. Use only positive exponents (i.e. no radicals, no negative exponents).

(a). $\frac{m^{-3}}{m^8}$

(b). $\left(\frac{x^3y^{-2}z^0}{3^{-1}x^2y^{-3}z}\right)^{-3}$

(c). $(2x^{3/2})^2 \cdot (5x^{1/2}y^{-2/3})$

(d). $[(u^2v^3)^{-2}]^2$

6. (6 pts). Simplify the following expressions and leave the radical sign in your answer. [Assume nonnegative variables.]

$$\frac{\sqrt{50x^4y^9}}{\sqrt{2xy^3}}$$

7. (12 pts).

(a). Rewrite the following in exponential form and simplify. $4a\sqrt[3]{a^2}$

(b). Write the following in radical form. $-2x^{3/4}$

(c). Write the following in the form cx^n where c is a constant (possibly a fraction) and n is a rational number (possibly negative).

$$\frac{1}{3\sqrt{x}}$$

(d). Rationalize the denominator and simplify. $\frac{2x}{\sqrt{3x^2y}}$

8. (28 pts). Perform the indicated operations and simplify.

(a). $a - 1 + [3a - 2b - (4a - 3b + 4)]$

(b). $(2x - 3)(x + 4)$

(c). $(2x^2 - y)(2x^2 + y)$

(d). $(x + 2y)^3$

(e). $(2 - x^2)(2x^3 - 4x + 1)$

(f). $\left(\frac{1}{2} + x\right)^2$

(g). $\left(x^{2/3} + 2\right)\left(x^{4/3} - 1\right)$

9. (4 pts). A restaurant charges \$120 to rent a private room for a party. They also charge \$22 per person for the meal. If x is the number of people attending, write an expression for the total cost private party.