Sec 4   **Name:** _____
Winter 2019
Exam 1   **Time Limit: 90 min**

- **DO NOT open the exam booklet until you are told to begin. You should write your name and section number at the top and read the instructions.**

- Organize your work, in a reasonably neat and coherent way, in the space provided. If you wish for something to not be graded, please strike it out neatly. I will grade only work on the exam paper, unless you clearly indicate your desire for me to grade work on additional pages.

- You may use any results from class, homework or the text, but you must cite the result you are using. You must prove everything else.

- You needn't spend your time rewriting definitions or axioms on the exam.

- When you have completed your test, hand it to me and go have a great weekend!

Problem	Points	Score
1	6	
2	9	
3	9	
4	9	
5	9	
Total:	42	

1. Evaluate the following expressions. Do not use a calculator and show all your work.

    (a) (3 points) $2 \cdot (4 - 3 \cdot (5 - 1) \div 2)$

    (b) (3 points) $\dfrac{(4 + 3 \cdot 4)}{2^3 - 2} \cdot (4 \cdot 8 \div 2)$

2. Simplify the following expressions and write with only positive exponents.

    (a) (3 points) $\left(\dfrac{x^{-1}y^2}{y^3 x} \right)$

    (b) (3 points) $\dfrac{2a^3 b^4 + 8b^2}{4a^2 b} \div (5a^{-1}b^3)$

    (c) (3 points) $(-2a)^{-3} b^3 (3a^2 b^{-1})^2$

3. Completely factor the following expressions.

    (a) (3 points) $2x^2 - 4x + xy - 2y$

    (b) (3 points) $-2x^3 + 2x^2 + 4x$

    (c) (3 points) $9 - (2x + 1)^2$

4. Simplify each expression

    (a) (3 points) $\dfrac{x-8}{x^2 + x - 72}$

    (b) (3 points) $\dfrac{y^2 - 9}{y^2} \div \dfrac{y^5 + 3y^4}{y + 2}$

    (c) (3 points) $\dfrac{3x}{x^2 - x - 2} - \dfrac{2 + x}{x^2 - 1}$

5. Evaluate or express in terms of a radical which cannot be simplified. There should be no radicals left in denominators.

(a) (3 points) $\left(-\dfrac{8}{27}\right)^{2/3}$

(b) (3 points) $\dfrac{\sqrt{3} - \sqrt{5}}{\sqrt{3} + \sqrt{7}}$

(c) (3 points) $\sqrt{48}$