

Math 195 Quiz 4A  
February 20, 2019

Name: ANSWERS

Instructions: No calculators! Answer all problems in the space provided! Do your rough work on scrap paper.

1. Complete the following rules:

(a)  $x^n \cdot x^m = x^{n+m}$  (b)  $x^{-a} = \frac{1}{x^a}$  (c)  $x^{m/n} = \sqrt[n]{x^m}$  (d)  $\frac{x^n}{x^m} = x^{n-m}$   
 (e)  $x^2 - y^2 = (x-y)(x+y)$  (f)  $x^3 - y^3 = (x-y)(x^2 + xy + y^2)$

2. Reduce and simplify the following rational expressions:

(a)  $\frac{x^6-64}{x^2-4} = \frac{(x^2+2x+4)(x^2-2x+4)}{(x-2)(x+2)}$  (b)  $\frac{250a+100ax+10ax^2}{50a-2ax^2} = \frac{5(x+5)}{5-x}$   
 (c)  $\frac{ad-ad^2}{d-1} = -ad$  (d)  $\frac{42x^2+23x-10}{14x^2+45x-14} = \frac{6x+5}{2x+7}$   
 (e)  $\frac{28x^3y^5+42x^4y^3}{7x^2y^2} = 4xy^3 + 6x^2y$

3. Combine and simplify the following rational expressions:

(a)  $\frac{3a^2+7ab-20b^2}{a^2+5ab+4b^2} \div \frac{3a^2-17ab+20b^2}{3a-12b} = \frac{3}{a+b}$  (b)  $\frac{2x-4}{x+2} - \frac{x-6}{x+2} = 1$   
 (c)  $5 - \frac{x}{2x+1} = \frac{9x+5}{2x+1}$  (d)  $2 + \frac{1}{x} + \frac{x}{3x+9} - \frac{3}{x^2+3x} = \frac{7}{3}$   
 (e)  $\frac{4 - \frac{1}{x^2}}{4 - \frac{4}{x} + \frac{1}{x^2}} = \frac{2x+1}{2x-1}$

Bonus (after attempting the problems above, do these for extra credit):

1. Combine:  $\left(1 + \frac{2}{x+1}\right)\left(1 + \frac{2}{x+3}\right)\left(1 + \frac{2}{x+5}\right)\left(1 + \frac{2}{x+7}\right) = \frac{x+9}{x+1}$   
 2. Solve for  $x$ :  $\frac{x}{x-2} + \frac{2}{3} = \frac{2}{x-2} \Rightarrow x = \text{no solution!}$