

Math 195 Quiz 4B

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

2. Combine and simplify the following rational expressions:

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

3. Reduce and simplify the following rational expressions:

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

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

1. Solve for x : $\frac{x}{x+2} + \frac{2}{3} = \frac{2}{x+2} \Rightarrow x = \frac{2}{5}$

2. Combine: $\left(1 + \frac{2}{x+2}\right)\left(1 + \frac{2}{x+4}\right)\left(1 + \frac{2}{x+6}\right)\left(1 + \frac{2}{x+8}\right) = \frac{x+10}{x+2}$