Math 195 Quiz 3A
February 11, 2019

Name: ANSWERS

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

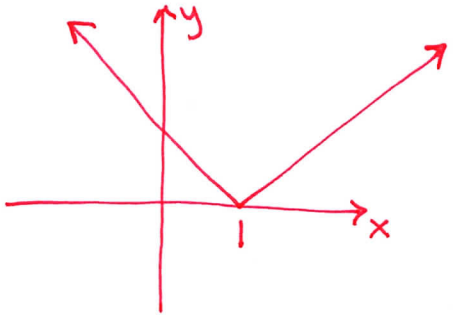
1. Complete the following rules:

   (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. Define: $|x| =$ $\begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

3. Sketch: $y = |x - 1|$



4. State the domain, in interval notation, of $f(x) = \sqrt{4 - x^2} + x^{-1/4}$. $dom(f) =$ $(0, 2]$

5. Simplify/combine as appropriate, you may leave negative powers in your answer:

   (a) $\left(\frac{x^3y^{-2}z^{-1}}{3x^7y^5z^{-2}}\right)^2 \left(\frac{2x^5y^{-3}z^2}{5x^{-2}y^4z^{-2}}\right)^{-2} =$ $\frac{25}{36} x^{-22} z^{-6}$ (b) $|x|\sqrt{8xy^2z^3} - |yz|\sqrt{18x^3z} =$ $-|xyz|\sqrt{2xz}$

6. Factor: $x^3 + x^2 - 4x - 4 =$ $(x+1)(x-2)(x+2)$

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

1. Reduce to lowest terms: $\frac{y^4-16}{2+y} =$ $(y-2)(y^2+4)$

2. Factor completely: $6x^{7/3} + x^{4/3} - 2x^{1/3} =$ $x^{\frac{1}{3}}(2x-1)(3x+2)$

3. Expand: $(x + 1)^3 =$ $x^3 + 3x^2 + 3x + 1$