

Math 1203 Quiz 1

January 16, 2019

Name: \_\_\_\_\_

Instructions: Answer all problems in the space provided! No calculators! Use your own scrap paper.

1. Evaluate each expression without a calculator.

(a)  $(-3)^4 =$  \_\_\_\_\_ (b)  $-3^4 =$  \_\_\_\_\_ (c)  $3^{-4} =$  \_\_\_\_\_

(d)  $\frac{5^{23}}{5^{21}} =$  \_\_\_\_\_ (e)  $\left(\frac{2}{3}\right)^{-2} =$  \_\_\_\_\_ (f)  $16^{-3/4} =$  \_\_\_\_\_

2. Expand and simplify.

(a)  $(x + 3)(4x - 5) =$  \_\_\_\_\_ (b)  $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) =$  \_\_\_\_\_

(c)  $(2x + 3)^2 =$  \_\_\_\_\_

3. Factor each expression.

(a)  $4x^2 - 25 =$  \_\_\_\_\_ (b)  $2x^2 + 5x - 12 =$  \_\_\_\_\_

(c)  $x^3 - 3x^2 - 4x + 12 =$  \_\_\_\_\_ (d)  $x^4 + 27x =$  \_\_\_\_\_

(e)  $3x^{3/2} - 9x^{1/2} + 6x^{-1/2} =$  \_\_\_\_\_ (f)  $x^3y - 4xy =$  \_\_\_\_\_

4. Simplify the rational expression.

(a)  $\frac{x^2+3x+2}{x^2-x-2} =$  \_\_\_\_\_ (b)  $\frac{2x^2-x-1}{x^2-9} \cdot \frac{x+3}{2x+1} =$  \_\_\_\_\_

(c)  $\frac{x^2}{x^2-4} - \frac{x+1}{x+2} =$  \_\_\_\_\_ (d)  $\frac{\frac{y-x}{x-y}}{\frac{1}{y} - \frac{1}{x}} =$  \_\_\_\_\_

5. Rationalize the expression and simplify.

(a)  $\frac{\sqrt{10}}{\sqrt{5}-2} =$  \_\_\_\_\_ (b)  $\frac{\sqrt{4+h}-2}{h} =$  \_\_\_\_\_

6. Solve the equations for all real solutions.

(a)  $2x^2 + 4x + 1 = 0$   $x =$  \_\_\_\_\_ (b)  $x^2 - x - 12 = 0$   $x =$  \_\_\_\_\_

7. Solve each inequality. Write your answer in interval notation.

(a)  $-4 < 5 - 3x \leq 17$   $x \in$  \_\_\_\_\_ (b)  $x^2 < 2x + 8$   $x \in$  \_\_\_\_\_

(c)  $|x - 4| < 3$   $x \in$  \_\_\_\_\_ (d)  $\frac{2x-3}{x+1} \leq 1$   $x \in$  \_\_\_\_\_

8. State whether each equation is true or false by writing "T" or "F", respectively.

(a)  $(p + q)^2 = p^2 + q^2$  \_\_\_\_\_ (b)  $\sqrt{ab} = \sqrt{a}\sqrt{b}$  \_\_\_\_\_ (c)  $\sqrt{a^2 + b^2} = a + b$  \_\_\_\_\_

(c)  $\frac{1+TC}{c} = 1 + T$  \_\_\_\_\_ (e)  $\frac{1}{x-y} = \frac{1}{x} - \frac{1}{y}$  \_\_\_\_\_ (f)  $\frac{\frac{1}{x}}{\frac{a}{x} - \frac{b}{x}} = \frac{1}{a-b}$  \_\_\_\_\_

9. Find an equation for the line that passes through the point  $(2, -5)$  and

(a) has slope  $-3$  \_\_\_\_\_ (b) is parallel to the  $x$ -axis \_\_\_\_\_

(c) is parallel to the  $y$ -axis \_\_\_\_\_ (d) is parallel to  $2x - 4y = 3$  \_\_\_\_\_

10. Find the equation of the line that contains  $A(-7, 4)$  and  $B(5, -12)$ . \_\_\_\_\_

11. If  $f(x) = x^2$ , find and simplify  $\frac{f(2+h)-f(2)}{h} =$  \_\_\_\_\_

12. Find the domain of the following functions. Write in interval notation.

(a)  $f(x) = \frac{2x+1}{x^2+x-2}$   $D:$  \_\_\_\_\_ (b)  $g(x) = \frac{\sqrt[3]{x}}{x^2+1}$   $D:$  \_\_\_\_\_

13. If  $f(x) = x^2 + 2x - 1$  and  $g(x) = 2x - 3$ , find:

(a)  $f \circ g$  \_\_\_\_\_ (b)  $g \circ f$  \_\_\_\_\_

14. Sketch the graphs of the given functions.

(a)  $y = x^2$

(b)  $y = x^3$

(c)  $y = 4 - x^2$

(c)  $y = \sqrt{x}$

(e)  $y = \frac{1}{x}$

(f)  $2x + 3y = 6$