

Math 1010 Section 5 Final

Name: _____

Read all directions carefully and show all your work for full credit.

Each of the following questions is worth 10 points total. Please complete all of the first 20 questions. Then on the remaining six do the best that you can. Each of these six questions is worth 10 points and to get the final grade I will take your score on the first 20 plus your score on the last 6 questions, cap it at 40, and take the total grade out of 230. Good Luck!!

1. Find all real and complex solutions to

$$\frac{4x+2}{x+1} - \frac{2x+3}{x+2} = 0$$

2. Find the Distance between the two points, and find the midpoint on the line segment connecting the points.

$$(3,-1)(-5,-3)$$

3. Find the slope, y-intercept, x-intercept, and graph the following line. $5x+2y=7$

4. Multiply out the following expression and simplify by combining like terms.

$$(3a - 5)(2a - 4)(a + 2)$$

5. Use either substitution or elimination to solve the following systems

$$4x-3y=-5$$

$$20x+6y=10$$

6. Find all complex and real solutions to $\sqrt[5]{s^2 - 2s + 1} - \sqrt[5]{2s^2 + 5} = 0$

7. Find all real and complex solutions to

$$5x^4 - 2x^3 + 9x^2 = 2x^2$$

8. Use your knowledge of shifts and reflections of functions to graph

$$P(x) = -(x + 4)^3 - 1$$

9. Find all solutions to the absolute value equation $|2x + 1| = 7 + 6x$

10. Perform the Division $\frac{6x^4 - 7x^3 + 2x - 11}{3x + 1}$

11. Use either substitution or elimination to solve the following system

$$x-5y=4$$

$$3x+y=-36$$

12. Write down the equation for a line that passes through (6,2) and is perpendicular to the line $4x+5y=11$

13. Sketch the graph on the real number line of all solutions to $3y + 7 \geq 2y - 9$

14. Factor the following polynomial completely. $6x^7 + 150x^5 - 6x^4 - 150x^2$

15. Perform the Division $\frac{10x^5 - 27x^4 - 13x^3 - 25x^2 + 50x + 13}{x - 3}$

16. Factor the following polynomial completely $x^4 + 4x^3 + 2x - 72 - 10x + 5x^3$

17. Simplify the following expression as far as you can using the laws of exponents.

$$\frac{(x+1)^2 \sqrt{x^2+2x+3}}{\sqrt[8]{(x^2+2x+3)^4} (\sqrt[3]{x+1})^3}$$

18. Evaluate the function (don't need to simplify) $Y(p) = p^2 - \sqrt{p} + \frac{1}{p}$ at $Y(4)$ and $p=4t+1$

19. Find the equation for a line that passes through the points (7,-6) and (-1,3)

20. Find the domain of the function $G(t) = \frac{\sqrt{x-7} \sqrt[4]{2x+5} \sqrt[3]{x^3-4x+1}}{x^3-3x^2-x+3}$

21. Solve the following system using the method of substitution. Hint(Look at the last two equations first; solve them then look at the first equation)

$$x-2y+z=5$$

$$y+3z=7$$

$$y+z=3$$

22. Find all solutions (there are 4) to the absolute value equation $|x + 4| - |3x + 6| = 3x - 7$

23. Find all real and complex solutions of $\sqrt{x+5} - \sqrt[3]{x-5\sqrt{5}} = 0$

24. Find all real and complex solutions to $\frac{x^2}{x^2+4x+3} - \frac{3x+1}{x^2+3x+2} = 1$

25. Find all real and complex solutions to $\frac{\sqrt{x^3+3x^2+3x+1}}{\sqrt[3]{x^2+1}} + \frac{(\sqrt[3]{x^2+1})^2}{\sqrt{x+1}} = 0$
Hint(divide $x^3 + 3x^2 + 3x + 1$ by $x+1$ twice)

26. Graph all solutions to the absolute value equation $3 \leq ||2x + 5| - 4| \leq 6$ on the real number line.