Math 190 Draft Final

You have 2hr 15min. Answer each non-graph question neatly on the line provided.

Name: _____

Page	Points	Score
1	8	
2	12	
3	12	
4	12	
5	12	
6	12	
7	12	
8	12	
9	8	
Total:	100	

1. (4 points) Perform the indicated operations $\frac{3}{\frac{5}{3}} - \frac{\frac{3}{3}}{3}$ and simplify as much as possible.

1. _____

2. (4 points) Perform the division $\frac{x^2-16}{2x-8} \div \frac{x^2+4x}{4x}$ and then simplify completely as one rational expression.

2. _____

3. (4 points) Perform the multiplication $\left(x + \frac{5}{x}\right)^2$ and simplify completely. Leave no parenthesis in final answer.

3. _____

4. (4 points) Factor $(z-2)^2 - 5(z-2)$ completely.

4. _____

5. (4 points) Find all solutions a to $49a^2 - 1 = 0$.

5. _____

6. (4 points) Solve $2(3x - 5) \leq 4x + 12$. Express your answer in interval notation.

6. _____

7. (4 points) Find an equation of the line through the points $(-1, -2)$ and $(4, 3)$.

7. _____

8. (4 points) Find all solutions x to $x^2 - 4x = 12$.

8. _____

9. (4 points) Evaluate and simplify the expression $g(a+1)$ completely as one fraction when $g(t) = \frac{t^2-1}{t-1}$.

9. _____

10. (4 points) Perform the addition $\frac{5}{2x-3} + \frac{15}{(2x-3)^2}$ and then simplify completely as one rational expression.

10. _____

11. (4 points) Find the maximum or minimum value of $f(x) = 1-4x-x^2$. You must indicate if your answer is a maximum or minimum.

11. _____

12. (4 points) Find all solutions x to $\log_2(x) + \log_2(x-3) = 2$.

12. _____

13. (4 points) Simplify $\left(\frac{a^4 b^{-3}}{b^4}\right)^2$ as much as possible and eliminate any negative exponents.

13. _____

14. (4 points) Find the length of the arc that subtends a central angle of measure $20°$ in a circle of radius $13m$. You may leave π in your answer).

14. _____

15. (4 points) The angle of elevation to the top of a tall building is found to be $14°$ from the ground at a distance of 0.5 mi. from its base. Find the height of the building. (You may leave $\sin, \cos$, or $\tan$ in your answer).

15. _____

16. (4 points) Find $\tan^{-1}(\sqrt{3})$

16. _____

17. (4 points) Evaluate $\cos\left(\frac{7\pi}{6}\right)$

17. _____

18. (4 points) Find $\sin\theta$ if $\cos\theta = -\frac{5}{7}$ and θ is in quadrant II.

18. _____

19. (4 points) Solve $\frac{1}{t+9} = \frac{3}{t-2}$ for t.

19. _____

20. (4 points) [True/False] $f(x) = \frac{1}{x+10}$ and $g(x) = \frac{1}{x} + 10$ are inverses of each other.

20. _____

21. (4 points) Evaluate $27^{\frac{-2}{3}}$.

21. _____

22. (4 points) Sketch of the polynomial $f(x) = \sqrt{16 - x^2}$ by plotting points.

23. (4 points) Sketch the graph of f(x) = $\begin{cases} -1 & x < 0 \\ x^2 - 5 & x \geq 0 \end{cases}$

24. (4 points) Sketch the graph of $y = -\sqrt{x+2}$ not by plotting points but by starting with the graph of a standard function and applying transformations.

25. (4 points) Sketch the graph of $h(x) = \left(\frac{1}{3}\right)^x + 2$ not by plotting points but by starting with the graph of a standard function and applying transformations.