Math 193 Draft Final Exam

Answer each non-graph question neatly on the line provided.

Name: _____

1. (4 points) Evaluate $\sin(285°)$.

1. _____

2. (4 points) Find all solutions t to $2t^2 = 64$.

2. _____

3. (4 points) Find $\cos(2\theta)$ given that $\tan\theta = -\frac{4}{3}$

3. _____

4. (4 points) Find all solutions θ to $2\sec^2\theta - 4 = 0$ for $0 \leq \theta \leq 2\pi$.

4. _____

5. (4 points) Evaluate $\log_2\left(\frac{1}{64}\right)$.

5. _____

6. (4 points) Solve $\log_9(x-5) = 1 - \log_9(x+3)$ for x.

6. _____

7. (4 points) Evaluate $\tan\left(\sin^{-1}(\frac{-1}{2})\right)$.

7. _____

8. (4 points) Sketch the graph of $f(x) = 1 - 4x - x^2$.

9. (4 points) Find the terminal point on the unit circle determined by $-\frac{13\pi}{4}$ radians.

9. _____

10. (4 points) Determine the net change and the average rate of change of $f(x) = x^3 - 5x^2$ between $x = 5$ and $x = 10$.

10. _____

11. (4 points) Sketch the graph of $F(x) = |x| - x$ by making a table of values.

12. (4 points) Find $h^{-1}(-5)$ when $h(x) = 3 - 2x$.

12. _____

13. (4 points) Evaluate $f(f(2)) - g(g(3))$ when $f(x) = 5x - 3$ and $g(x) = 4 - x^2$.

13. _____

14. (4 points) Evaluate $\left(\frac{49}{36}\right)^{-\frac{3}{2}}$.

14. _____

15. (4 points) Simplify the difference quotient $\frac{f(1+h)-f(1)}{h}$ when $f(x) = \frac{2}{x+5}$.

15. _____

16. (4 points) Find the center and radius of the circle given by the equation $x^2 + y^2 - \frac{1}{4}x + \frac{1}{4}y = \frac{1}{32}$.

16. _____

17. (4 points) Find an equation of the line passing through the points $(5, -3)$ and $(-4, 8)$.

17. _____

18. (4 points) Solve the inequality $\frac{x}{x+2} > 5$. Express your answer in interval notation.

18. _____

19. (4 points) Perform the division $\frac{x^2-x-30}{x^2+5x} \div \frac{x^2-5x-6}{x^3+x^2}$ and simplify completely.

19. _____

20. (4 points) Find all solutions x to $\sqrt{9-x}+1 = x-6$.

20. _____

21. (5 points) Sketch the graph $y = 2 + \left(\frac{1}{5}\right)^{x+1}$. Label all intercepts and asymptotes on your sketch. State the domain and range using interval notation.

22. (4 points) Sketch the graph $f(x) = -\log_8(x - 6)$. Label all intercepts and asymptotes on your sketch. State the domain and range using interval notation.

23. (4 points) The initial size of a bacteria culture is 1000. After one hour the bacteria count is 8000. After how many hours will the bacteria population reach 15000? Assume the population grows exponentially. (You may leave $e, \ln$, or $\log$ in your answer.)

23. _____

24. (4 points) Solve $|3x + 5| = 0.1$ for x.

24. _____

25. (4 points) Sketch the graph $y = -5\sin(2x + \pi)$. Label three points on your graph: one maximum point, one minimum point, and one intercept.