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

Name: _____

ID: _____

1. (4 points) Find the inverse function of f(x) = 3x + 15.

2. (4 points) Simplify $\frac{a^2}{(2a^4a^{-2})^3}$ completely without using negative exponents.

3. (4 points) Evaluate $\left(\frac{16}{9}\right)^{\frac{3}{2}}$ and simplify completely.

2. _____

1. _____

3. _____

4. (4 points) Sketch the graph of $f(x) = 2^{x-1} + 1$. Label all asymptotes on your graph for full credit.

5. (4 points) Perform the multiplication $\frac{4x}{x^2-4} \cdot \frac{x+2}{16x}$.

6. (4 points) Perform the addition $\frac{1}{x+5} + 1$ and simplify completely.

7. (4 points) Find all solutions x to $\frac{6}{x+1} - \frac{1}{4} = \frac{1}{x+1}$.

8. (4 points) Find the domain $f(x) = \sqrt{x - 10}$. Express your answer in interval notation.

8. _____

7. _____

5. _____

9. (4 points) Find all real solutions of $7x^2 - 343 = 0$.

10. (4 points) Find an equation of the line that passes through (-1, 2) and is parallel to the line 4y+8x=10.

11. (4 points) Find the reference angle of 119° .

12. (4 points) Sketch the graph of $f(x) = \frac{x}{|x|}$.

9. _____

10. _____

13. (4 points) Solve $x^2 - 4x \le 32$. Express your answer using interval notation.

13. _____

14. (4 points) Use f(x) = x - 2 and $g(x) = 4 - x^2$ to evaluate $(f \circ g)(x)$. Simplify your answer.

15. (4 points) Find the average rate of change of $f(t) = t^2$ between $t = \frac{1}{4}$ and $t = \frac{1}{2}$.

15. _____

14._____

16. (4 points) Find the maximum value of $g(x) = -x^2 - 4x$.



17. (4 points) Find the range of the function whose graph is given.

17. _____

18. _____

18. (4 points) From the top of a 250-ft lighthouse the angle of depression to a ship in the ocean is 24°. How far is the ship from the base of the lighthouse? You may leave sin, cos, or tan in your answer.v

2 3 5 6 1 4 x 3 f(x) 2 3 5 1 6 g(x) 3 4 1 5 2 6 to evaluate f(g(1))

19. (4 points) Use the table



20. (4 points) Find the interval(s) on which the function whose graph is shown increasing.

- A. (-2, 0)
- B. (0, 2)
- C. (2, 4)
- D. (-2, 0), (2, 4)
- E. none of these

21. (4 points) Find all real solutions y of $\frac{y+1}{y^2+1} = \frac{2}{y+2}$.

		21
22.	(4 points) Evaluate $\log_2(\frac{1}{22})$.	
	A5	
	B. 5	
	C. -16	
	D. 16	
	E. none of these	
		22
23.	(4 points) (True or False) $\frac{8}{13} \ge \frac{9}{15}$.	
		23
24.	(4 points) Simplify $\left(4+\frac{1}{2}\right)\left(1-\frac{3}{4}\right)$ as one reduced fraction.	
	A. $\frac{-13}{6}$	
	B. $\frac{-13}{12}$	
	C. $\frac{13}{6}$	
	D. $\frac{13}{12}$	
	E. none of these	
		24
25.	(4 points) Evaluate $\cos\left(\frac{4\pi}{2}\right)$.	
	A. $\frac{\sqrt{3}}{2}$	
	B. $\frac{1}{2}$	
	C. $\frac{-\sqrt{3}}{2}$	
	D. $\frac{-1}{2}$	
	E. none of these	
		25
26.	(4 points) Find the center of the circle with equation $x^2 + y^2 + 10x - 12y + 10 =$	0
_0.	(1 points) i find the content of the entert with equation $w + g + 10w + 12g + 10$ A. $(-5, -6)$	0
	B. $(-5, 6)$	
	C. $(5, -6)$	
	D. (5,6)	
	E. none of these	
		26