Math 112 FINAL

Name _____

I.D. # _____

1. $(18\,pts)$ Given $f(x) = 2x + 3$ and $g(x) = x^2 - 1$, find

(a) domain of $g(x)$

(b) range of $g(x)$

(c) $g(3)$

(d) $(f \cdot g)(3)$

(e) $(f \circ g)(3)$

(f) $(g \circ f)(3)$

2. $(16\,pts)$ Given the equation $y = -2x - 4$,

(a) Find the x-intercept.

(b) Find the y-intercept.

(c) Find the slope.

(d) Graph the equation, indicate the x- and y-intercepts.

3. $(10\,pts)$

(a) Find the slope of line through $(2,\,-1)$ and $(-1,\,8)$.

(b) Find the distance between $(2,\,-1)$ and $(-1,\,8)$.

.

4.

(a) $(4\,pts)$ Solve the linear equation $4x - 2(x-1) = x + 3$

(b) $(6\,pts)$ Solve the quadratic equation $x^2 - 2x - 35 = 0$

(c) $(8\,pts)$ Solve the equation $x^4 - 9x^2 + 18 = 0$

5. $(9pts)$ Solve the absolute value inequality $|2x - 7| < 5$ and give the answer in interval notation.

6. $(8\,pts)$ Solve the equation $\frac{1}{x+1} - \frac{1}{x+2} = 1.$

7. $(6\ pts)$ Divide and write the result in standard form

$$\frac{2-i}{2+i}$$

8. $(12\ pts)$ Evaluate

(a) $\log_4 16$

(b) $\log_3 \frac{1}{27}$

(c) $\log_8 4 + \log_8 16$

9. Solve the equations analytically, and express solutions in exact form. (solutions in decimal form will not receive credits)

(a) $(8\ pts)\ 2^{x+2} = 3^x$

(b) $(9\ pts)\ log(x-4) + log(x+3) = log(x+12)$

10. $(9\ pts)$ Given the equation of a circle, find the center and the radius.

$x^2 + 4x + y^2 - 8y - 5 = 0$

11. $(8\ pts)$ Solve the system of linear equations

$$\begin{cases} 4x + 3y = 11 \\ 3x - 4y = 2 \end{cases}$$

12. $(6\ pts)$ Find the inverse function of $f(x) = x^3 - 2$

13. $(15\ pts)$ Given $\sin\alpha = -\frac{3}{5}$ with α in quadrant IV

(a) Find $\cos\alpha$

(b) Find $\tan\alpha$

(c) Find $\cot\alpha$

(d) Find $\sec\alpha$

(e) Find $\csc\alpha$

14. $(10\ pts)$ Find the $exact$ value for each of the followings. (answers in decimal form

will not receive credits)

(a) $sin\,315°$

(b) $cos\ \frac{5\pi}{6}$

15. $(10\,pts)$ Find the $exact$ value for each of the followings. (answers in decimal form will not receive credits)

(a) cos $\frac{11\pi}{12}$

(b) tan$105°$

16. $(6\,pts)$ Evaluate $\binom{8}{3}$

17. $(6\,pts)$ Evaluate $\sum_{i=1}^{4}(3i+2)$

18. $(16\,pts)$ Find the $exact$ values for the solutions of the following equations. (answers in decimal form will not receive credits)

(a) $cos\,(2x) = \frac{1}{2}, \quad 0 \leq x < 2\pi$

(b) $sin\,(2x) = cos\,x, \quad 0 \leq x < 2\pi$