

Math 112 Exam#2

Name _____

I.D. # _____

1. (15 pts) Graph the function $f(x) = \frac{x^2+1}{x-1}$ and indicate the x - and y -intercepts if there is any. State the horizontal, vertical, and oblique asymptotes if there is any.

2. (8 pts) Solve the equation $\frac{1}{x+1} + \frac{2}{x+2} = 3$.

3. (12 pts) Evaluate

(a) $\log_3 9$

(b) $\log_2 \frac{1}{8}$

(c) $\log_6 4 + \log_6 9$

4. (15 pts) Solve the equations analytically, and express solutions in exact form.

(a) $3^{x+2} = 9^x$

(b) $3^{x+2} = 5^x$

(c) $\log(x + 5) + \log(x + 2) = 1$

5. (10 pts) Given the equation of a circle, find the center and the radius.

$$x^2 + 6x + y^2 - 10y - 2 = 0$$

6. (10 pts) Find the coordinates of the foci of the ellipse with center $(1, 2)$; minor axis of length 6; major axis vertical and of length 10.

7. (10 pts) Solve the system of linear equations

$$\begin{cases} 2x + 3y = 5 \\ 3x - 2y = -12 \end{cases}$$

8. (10 pts) A chemist needs 10 liters of 25% alcohol solution. She has on hand a 80% alcohol solution. How many liters of water and how many liters of 80% alcohol solution should be mixed to get the required solution?

9. (6 pts) Determine if the following functions have an inverse function.

(a) $f(x) = \sqrt[3]{x}$

(b) $f(x) = \sqrt[3]{x^2}$

10. (4 pts) Find the inverse function of $f(x) = 3x - 2$