**MATH 0031 - Final Practice**

**Fall 2014**

1. Write a slope-intercept equation for a line passing through ( 6, - 4 ) that is:

a. Parallel to 5x – 8 = 3 y

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Perpendicular to 5x – 8 = 3 y

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Write a slope-intercept equation for a line with the given characteristics:

1. m = -5, passes through ( 2, -3 )

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Passes through ( -2, 1 ) and ( 4 , -2 )

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Add: =

4. Find the equation of a circle with center ( 2, 3) through ( -1, 4 ).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. What is the center and radius for this circle?

x2  – 6 x + y2 + 5 y = 10 Center = \_\_\_\_\_\_\_\_\_\_ Radius = \_\_\_\_\_\_\_\_

6. Cheryl has a rectangular garden with a perimeter of 56 m. The length is three times the width. Find the dimensions of the garden.

Garden is \_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_

7. If f ( x ) = x2 - 7 and g ( x ) = 

Find and simplify: f ( g ( x ) ) =

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. The time t required to empty a tank varies inversely as the rate r of pumping. If a pump can empty a tank in 20 minutes at the rate of 1400 kL / min, how long will it take the pump to empty the same tank at the rate of 500 kL / min?

Variation equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Time to empty = \_\_\_\_\_\_\_\_\_\_\_\_

9. Complex Arithmetic:

1. ( 2 - 3 i ) ( 5 + 4 i ) =

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.  =

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Graph: f ( x ) = 3 – x2, x < 2

x + 3, x > 2



11. Solve:

1. log ( x + 5 ) – log ( x – 3 ) = log 2

x = \_\_\_\_\_\_\_\_

1. ln ( x + 8 ) + ln ( x – 1 ) = 2 ln x

x = \_\_\_\_\_\_\_\_

12. Express in terms of sums and differences of logarithms and simplify.

log 2  ( b4  / 64 ) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Factor Completely. Note: All real roots are in the form p / q.

“p” is a factor of the constant term,

and “q” a factor of the leading coefficient.

a. x3 - 3 x2 – 10 x + 24

b. x3 - 3 x2 – 6 x + 8

14. Graph: f ( x ) = | x – 2 | + 5

15. Graph Rational Functions showing Asymptotes and Intercepts.

f ( x ) = 

16. Find a formula for the inverse of f ( x ) = 

f -1 (x) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. Using Compounded Interest Formula: For each of these cases, write an expression for the value of the CD after 5 years.

a. Joe purchases a CD for $3000 that earns 4 % interest, compounded semi-annually.

b. Pam purchases a CD for $6800 that earns 3.2 % interest, compounded quarterly.

c. Susan purchases a CD for $2750 that earns 3 % interest, compounded continuously.

18. Horizontal and Vertical Shifts:

a. Graph f ( x ) = 2x + 3

b. Graph h( x ) = ( x – 2 )3

19. Graph: f ( x ) = 

20. Solve by completing the square and check with the quadratic formula.

a. x2  - 4 = 4 x

b. 4 x2 + 4 x = - 7