MATH 1314 REVIEW FOR FINAL EXAM FALL 2019

1. Solve the inequality: $16 - 3x > 10$

   Write the solution in interval notation.

2. Given $f(x) = 3x^2 + 4x - 2$ find the following:

   a) $f(0) =$ _____

   b) $f(-x) =$ _____

   c) $f(x+1) =$ _____

   d) $f(x+h) =$ _____

3. Find the domain of the function $f(x) = \sqrt{4x - 20}$. Use interval notation.

4. For the given functions find the following:

   $f(x) = 4x + 7$ $g(x) = 8x - 1$

   a) $(f + g)(x) =$ _____

   b) $(g - f)(x) =$ _____

   c) $(f - g)(3) =$ _____

   d) $(f \cdot g)(2) =$ _____

5. Find and simplify the difference quotient of f given: $\frac{f(x+h)-f(x)}{h}$, $h \neq 0$

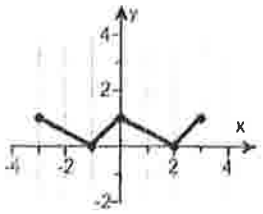
   $f(x) = x^2 - 8x + 3$

6. Given $f(x) = x^2 - 2x + 2$, find the value(s) for x such that $f(x) = 17$.

7. Using the given graph of the function f, find its domain and range.

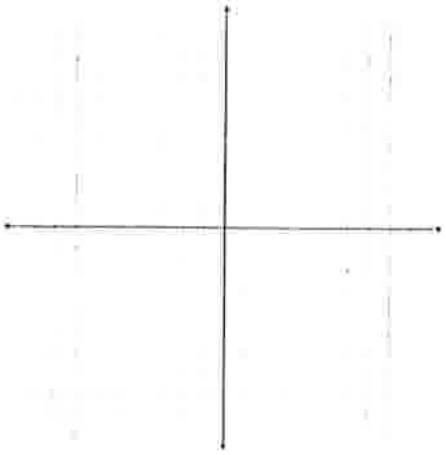
   Domain: _____

   Range: _____



8. The function f is defined as follows: $f(x) = \begin{cases} -3x + 4 \; if \; x < 2 \\ 2x - 1 \; if \; x \geq 2 \end{cases}$

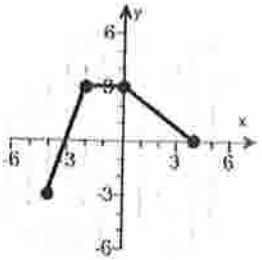
   Graph the function.



9. The graph of a function f is illustrated to the right. Use the graph of f and graph each of the following functions.

   a) $H(x) = f(x + 2) - 3$

   b) $G(x) = f(x) + 2$



10. Factor the given polynomial completely.

    $x^2 + 18x + 77$

11. Solve the equation: $(x - 8)(3x + 5) = 0$

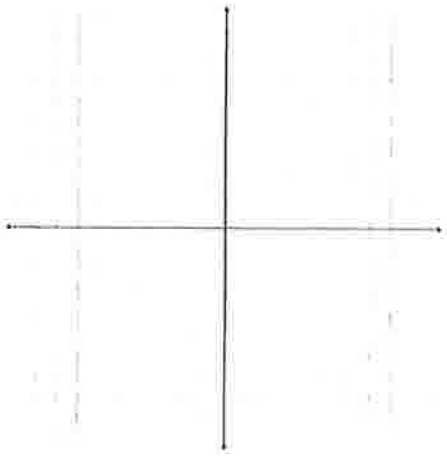
12. Find the zeros of the quadratic function by factoring: $g(x) = 3x^2 - 10x - 8$

13. Solve the quadratic equation by using the quadratic formula. Simplify your answer as much as possible.

$$x^2 + 6x = -4$$

14. Given the quadratic function $f(x) = x^2 - 4x + 3$ find the following and graph f.

a) the vertex



b) the y-intercept

c) the x-intercept(s)

15. Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find the value and where it occurs.

$f(x) = -2x^2 + 4x - 7$

16. Find a rational zero of the polynomial function and use it to find all of the zeros of the function.

$$f(x) = x^3 - 3x^2 - 25x - 21$$

17. Solve the equation: $3x^4 - 28x^3 + 81x^2 - 84x + 20 = 0$

18. Find the vertical and horizontal asymptotes, if any, for the following rational function.

$$R(x) = \frac{8x^2}{x^2 - 2x - 15}$$

19. Given the functions: $f(x) = 4x + 9$ and $g(x) = 2x - 5$, find the following

a) $(f \circ g)(x)$

b) $(g \circ f)(x)$

20. Given the functions: $f(x) = 3x + 3$ and $g(x) = x^2$, find the following

a) $(g \circ f)(x)$

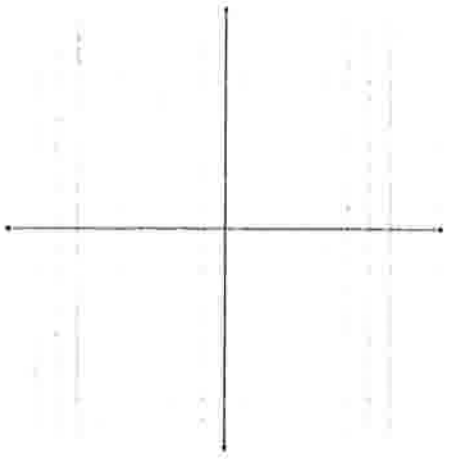
b) $(f \circ g)(-3)$

21) The function $f(x) = 6x - 3$ is one-to-one. Find the following and graph f and f^{-1}.

a) $f^{-1}(x) =$

b) Domain of f: Range of f:

c) Domain of f^{-1}: Range of f^{-1}:



22) Solve the equation: $64^{-x+52} = 128^{x}$

23) Solve the equation: $log_2(2x + 1) = 3$

24) Solve the equation: $log_4(5x) = 2$

25) Find the accumulated value of a \$400 investment after 4 years if interest is compounded quarterly at an annual rate of 5.2%.

26) How many years will it take for an investment of \$10,000 to grow to \$35,000?
Assume an interest rate of 9% compounded continuously.

27. Solve the system of equations by additon. If the system has no solution, say that it is inconsistent.

$$4x - 3y = -1$$
$$5x + y = 13$$

28. Solve the given system of equations using matrices. If the system has no solution, say that it is inconsistent.

$$x - 3y + 4z = 24$$
$$2x + y + z = 6$$
$$-2x + 3y - 3z = -22$$

29. Solve the radical equation: $\sqrt{5x - 1} = x - 3$

Be sure to check all solutions.

30. The quadratic function $f(x) = x^2 - 2x - 8$ has a vertex at (1 , -9), a y-intercept at (0, -8), and x-intercepts at (4, 0) and (-2, 0). Also, f(2) = -8. Sketch the graph of this quadratic function by plotting the 5 given points.