Precalculus Final Exam REVIEW – Non-Calculator

1. Find the domain of the function.

   $q(w) = \dfrac{2w}{w-6}$

2. Determine the domain of the function $f(x) = \dfrac{x^2-4}{x^2+3x+2}$.

3. Find the difference quotient and simplify your answer.

   $f(y) = -2y^2-4y,\ \dfrac{f(3+h)-f(3)}{h},\ h \neq 0$

4. Describe the sequence of transformations from the related common function $f(x) = \sqrt{x}$ to *g*.

   $g(x) = -\sqrt{x} - 7$

5. Find $g \circ f$.

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

6. Sketch the given function.

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

7. Evaluate the function at the specified value of the independent variable and simplify.

   $g(t) = \dfrac{-7t}{9t+2}$

   $g(p-6)$

8. Find the vertex of the parabola.

   $y = x^2 - 8x + 16$

   A) Can you find it by putting it in vertex form?
   B) Can you find it by using part of the quadratic formula

9. Find $(f/g)(x)$.

   $f(x) = -9x^2+6x$ $\qquad$ $g(x) = 5-x$

10. Assume that *x*, *y* and *b* are positive numbers. Use the properties of logarithms to write the expression $\log_b x^5 y^8$ in terms of the logarithms of *x* and *y*.

11. Use long division to divide.

$$\left(x^4 - x^2 - 2\right) \div \left(x^2 - 3x - 1\right)$$

12. If $x = -4$ is a zero of $x^3 + 3x^2 - 16x - 48 = 0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

13. Determine the zeros (if any) of the rational function $f(x) = \dfrac{x^2 - 64}{x - 6}$.

14. Find the vertex of the parabolic graph of the equation.

$y = 6(x - 5)^2 + 2$

A) Keep it simple
B) Is it a maximum or a minimum?

15. Tell whether the function $y = x^5 + 7x^3$ is even or odd. If it is neither, so indicate.

A) Remember this is the NON calculator section
B) How does an even or odd function look algebraically and graphically?

16. Determine the *x*-intercept(s) of the quadratic function $f(x) = x^2 + 3x - 18$.

17. Graph the function $y = -(x + 2)^3 - 1$

18. Find a polynomial with the given zeros.
$3, -5$

19. Evaluate the function $f(x) = \log_5 x$ at $x = \dfrac{1}{125}$ without using a calculator.

20. Simplify the expression.

$\log_4 4^7$

A) Take advantage of easier problems
B) Remember all the properties

21. Solve using any method.

$$\begin{cases} 6x+3y=-5 \\ y=x-3 \end{cases}$$

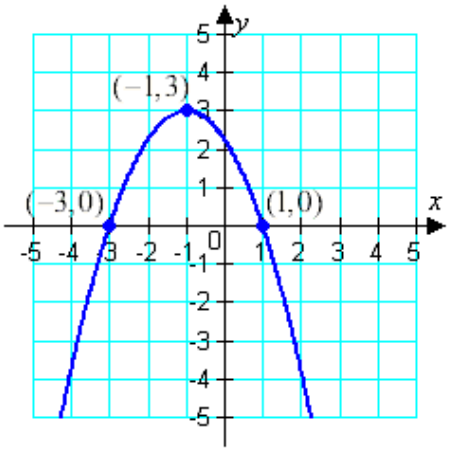
22. Use back-substitution to solve the system of linear equations.

$$\begin{cases} 2x-5y+6z=66 \\ 5y+4z=-2 \\ z=7 \end{cases}$$

23. Write the partial fraction decomposition of the rational expression.

$$\frac{9}{x^2+16x+63}$$

24. Find the standard form of the quadratic function shown below:



25. Find the vertex and directrix of the parabola.

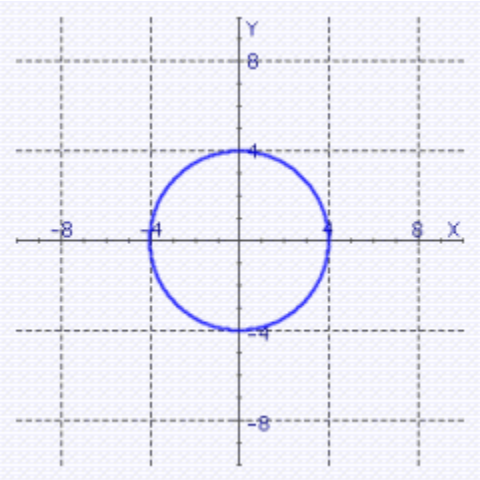
$$x^2-4x-8y-68=0$$

26. Let $f(x) = 4x - 2$, $g(x) = 7x - 5$. Find the function.

$(f-g)(x)$

A) Where do you need to be really careful?
B) Do parentheses even matter?

27. Find the equation of the circle graphed below.



A) Standardized tests LOVE circles
B) What is the most missed part of these type of questions?

28. Find the standard form of the equation of the parabola with the given characteristic and vertex at the origin.

directrix: $x = -3$