MATH 1314

Final Exam Review

30 Multiple Choice Questions (Equally Weighted)

1. Simplify: $(7 - i)(2 + i)$

2. Simplify: $\frac{5-i}{3+i}$

3. Solve for x: $|5x + 8| < 3$

4. Find the domain: $f(x) = \frac{\sqrt{x+3}}{x-8}$

5. Calculate f(5) if $f(x) = \begin{cases} x + 3, x < 0 \\ x^2, 0 \leq x \leq 5 \\ 2x - 3, x > 5 \end{cases}$

6. Solve for x using substitution:

$$3(x-5)-11\sqrt{x-5}-4=0$$

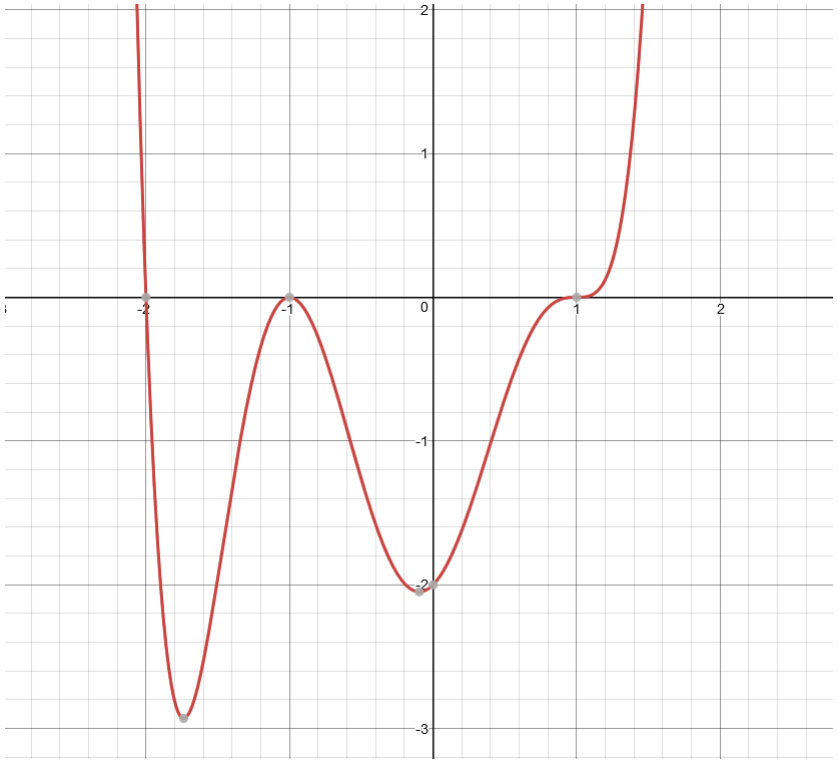
7. What transformations will take the graph of $f(x) = x^3$ to the graph of $g(x) = 5 - (x + 1)^3$

8. Find the vertex of the following: $f(x) = 2x^2 + 8x + 6$

9. If $f(x) = 2x^2 + 1$ and $g(x) = x - 3$, determine $g(f(2))$

10. Determine the inverse of: $f(x) = \frac{x+5}{x-3}$

11. Identify the function corresponding to the graph:



12. Identify the quotient and remainder of the following:

$$\frac{3x^3 + 2x - 4}{x + 3}$$

13. Identify the asymptote and range of the following:

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

Asymptote: x = y =

Range:

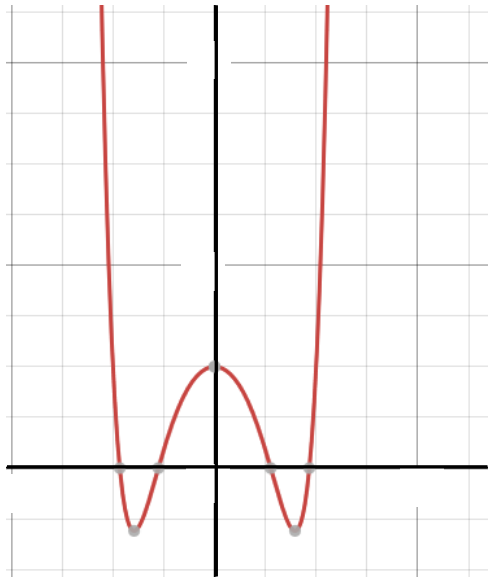
14. Solve $\log_5(x + 3) = 2$

15. Solve: $\log_8(x + 3) - \log_8(x - 6) = \log_8 4$

16. Solve the following for x: $\frac{2}{x^2} + \frac{8}{x} = -8$

17. The function
$f(x)= ax^5 + bx^3 - cx$
passes through the point (8, -7). What other point must it pass through?

Which is a possible graph of this function:



18. Solve this system:

$$5x + 4y = 6$$
$$y = -\frac{5}{4}x + 3$$

19. Rewrite the equation of the parabola in standard form: $y = 3x^2 + 12x + 7$

20. Simplify: $\frac{\sqrt{-100}+30}{\sqrt{-4}\cdot\sqrt{-25}}$

21. Find all complex solutions to: $5x^2 = -120$

22. Solve for x: $\sqrt{x-1}+7=x$

23. Solve the inequality: $7x^2 - 5x - 3 < 6x^2 + 3$

24. Solve the inequality: $\frac{(x-3)(x+5)}{x+10} \geq 0$

25. Write the polynomial function with roots of 3i and 5, with an y-intercept of 90.

26. Find the vertical asymptotes, horizontal asymptotes, and hole of the following:

$$f(x) = \frac{x^2+16x+60}{2x^2-72}$$

27. Expand the logarithmic expression:

$$\log_6\left(\frac{(x+3)^8}{x^4\sqrt{x-5}}\right)$$

28. Simplify: $\log_3\left(\frac{12}{\sqrt{27}}\right) - \log_3(4)$

29. The polynomial,
$p(x) = x^4 - 10x^3 + 19x^2 - 30x + 48$ has a root located at (8,0). Determine all roots of the polynomial.