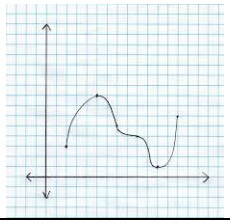
Algebra 2 Final Review Study Guide

Module 1

1. Give the domain and range of the function: See sketch

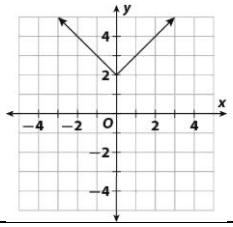


2. How would you translate the graph of $y = -x^2$ to produce the graph of $y = -x^2 + 7$

3. What is the transformation of the graph of $f(x) = x^3$ that yields $f(x) = 3(x + 2)^3 - 4$?

4. Which is an equation for the inverse of $y = 3x - 4$?

5. State the domain, range as an inequality, interval and set notation. Also state the end behavior.



Module 2

6. Sketch the parent graph and translate it to obtain a graph $y - 5 = |x + 6|$

7. $4|x+7|+3 = 59$

8. $-5|x+1| +2 =12$

9. Solve $2|x + 15| > 8$

Module 3

10. Solve $5x^2 - 4 = -8$

11. Solve $x^2 +64 = 0$

12. Simplify the expression. $(5 + 9i) - (3 - 3i)$

13. Simplify $(i\sqrt{5} + 3)(i\sqrt{5} - 3)$

14. Solve $x^2 + 2x = -2$

15. Find the zeros of $x^2 + 8x + 10$

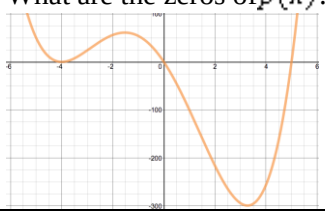
16. Solve $x^2 + 3x - 10 = 0$

Module 5

17. Identify the parent function for $(x - 5)^4$ and describe what transformation of the parent function it represents.

18. Sketch: $y= -x(x+2)(x-3)(x+5)$

19. The graph of the polynomial function $p(x)$ is shown. What are the zeros of $p(x)$?



20. Write a polynomial equation that could result in the graph shown in #19.

Module 6

21. Subtract. $(x^3 - 4x + 7) - (3x^3 - 2x^2 + 6x - 4)$

22. Multiply. $(2x+3)(2x^2 - 5x+1)$

23. Expand. $(x + 3y)^5$ Be able to find a term without expanding.

24. Completely factor $5x^4 - 80$.

25. When $x^3 + 64$ is written as a product of a binomial and a trinomial, what is the trinomial factor?

26. Is (x-3) a factor of $f(x) = 4x^3 - 12x^2 + 2x - 5$?

27. What is the complete factorization of $10x^4 - 5x^3 - 30x^2$

28. Factor $x^3 + 3x^2 - x - 3$

29. Divide. $(4x^2 - 9x + 7)/(x - 3)$

30. Given $f(x) = 2x^2 - 5x - 12$ and $g(x) = 2x + 3$,

Find $a)\ \dfrac{f(x)}{g(x)}$ $b)\ f(x)g(x)$ $c)\ g(f(x))$

Module 7

31. What are the possible rational roots of $7x^3 - 5x^2 + 12x - 3$

32. **a)** What is the degree of the simplest polynomial with integer coefficients that has $\sqrt{3}$, 3i and -5i as zeros?
b) Find the polynomial.

33. Find all the zeros of $x^3 - 3x^2 + 4x - 12$

34. Find all the zeros of $x^4 + 5x^3 + 6x^2 - 4x - 8$

Module 8

35. Identify the asymptotes, domain, and range of the function. $f(x) = \dfrac{1}{x-8} + 9$

36. Identify all asymptotes of $f(x) = (x^2 + 4x+4)/(x^2 - 4)$

37. Identify holes in the graph of $f(x) = \frac{x^2+7x+10}{x+3}$

38. Sketch $f(x) = \dfrac{2}{x-2} + 6$

Module 9

39. Simplify $\dfrac{x+5}{x^2 - 9} + \dfrac{-3x - 8}{x^2 - 9}$

40. Simplify $\dfrac{1}{x^2 + 4x - 5} - \dfrac{1}{x^2 - 4x + 3}$

41. Simplify $\dfrac{x^2-4}{x^2+6x+8} \cdot \dfrac{x^2}{x^2-2x}$

42. Simplify $\dfrac{x^2 - 9x + 14}{x^2 + 9x + 14}, \dfrac{x^2 - 49}{x^2 - 4}$

43. Simplify $a)\ i^{323}$ $b)\ \dfrac{3}{2+i}$ $c)\ \dfrac{2-3i}{6-5i}$

44. Simplify $a)\ \dfrac{10!7!}{5!11!}$ $b)\ \dfrac{n!}{(n-2)!}$