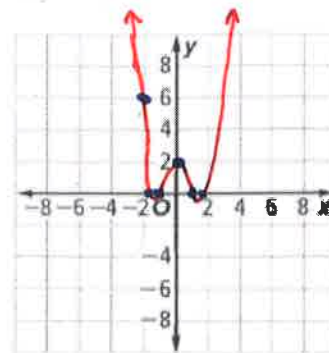


Algebra II - Final Exam Review

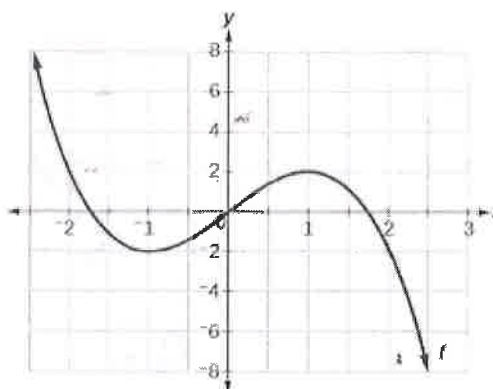
1. 4.1, 4.2 Sketch the graph
- $f(x) = x^4 - 3x^2 + 2$
- .



2. 4.1, 4.2 Identify the zeros for the graph of
- $f(x) = (x + 2)(x^2 - 5x + 3)$
- .

$$f(x) = 0 \text{ when } x = -2, \frac{5 + \sqrt{13}}{2}, \frac{5 - \sqrt{13}}{2}$$

3. 4.2 Identify the following:

Relative Max (1, 2)Relative Min (-1, -2)Zeros: between -2 and -1.5,between 1.5 and 2,and $x = \underline{0}$.

4. 4.3 What is the product of
- $(2x - 4)(3x^2 + 5x - 3)$

$$6x^3 - 2x^2 - 26x + 12$$

5. 4.4 Divide using long division or synthetic
- $(x^4 + 2x^3 - 5x^2 + 1) \div (x + 1)$

$$x^3 + x^2 - 6x + 6 - \frac{5}{x+1}$$

6. 4.5 What is the binomial expansion of
- $(2x - 3y)^3$

$$8x^3 - 36x^2y + 54xy^2 - 27y^3$$

7. 5.1 Use a graphing calculator to solve
- $-x^4 - 2x^3 + 4x^2 + 13 = 12$
- , round to the nearest hundredth.

$$x \approx 1.35, -3.26$$

8. 5.2 Solve
- $x^5 + 243 = 0$

$$x = -3$$

9. 5.4 If
- $x + 3$
- is one of the factors of
- $3x^3 - 2x^2 - 53x - 60$
- , use synthetic division to find the other two.

$$3x + 4 \quad \text{and} \quad x - 5$$

10. 5.5 Determine how many real/imaginary solutions $f(x) = 2x^3 - 7x^2 + 8x - 11$

1 REAL, 2 imaginary (complex) solutions

11. 6.1 If $f(x) = 2x^2 - 3$ and $g(x) = \sqrt{4 - 5x}$, find $f(g(x)) =$

$$f(g(x)) = 5 - 10x$$

12. 6.1 Now find $g(f(x))$ if $f(x) = 2x^2 - 3$ and $g(x) = \sqrt{4 - 5x}$

$$g(f(x)) = \sqrt{19 - 10x^2}$$

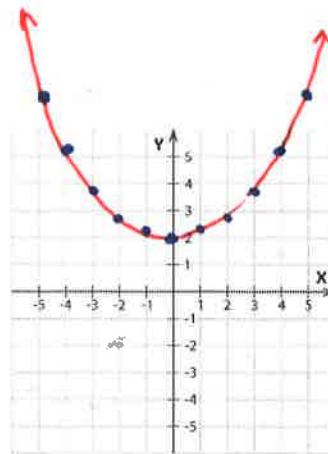
For 13-15, $f(x) = \sqrt{5x - 10}$

13. 6.2 Find the inverse of $f(x)$.

$$f^{-1}(x) = \frac{x^2 + 10}{5} \text{ or } \frac{1}{5}x^2 + 2$$

14. 6.2 Using the graph at the right, Graph the inverse of $f(x)$.

SHOWN



15. 6.2 Find the value of $f^{-1}(7)$

$$f^{-1}(7) = \frac{59}{5}$$

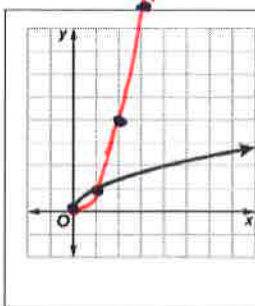
16. 6.3 a. Write $x^{\frac{2}{5}}$ in radical form:

$$\sqrt[5]{x^2} \text{ or } (\sqrt[5]{x})^2$$

b. Write $\sqrt[7]{x^5}$ in exponential form:

$$x^{\frac{5}{7}}$$

17. 6.4 The graph of a parent function is shown, Graph and write the inverse of the graph.



INVERSE EQUATION

$$y = x^2$$

18. 6.5 Simplify $(x + \sqrt{5})(x - \sqrt{5})$

$$x^2 - 5$$

19. 6.5 Simplify the expression: $\frac{7}{5 - \sqrt{2}}$

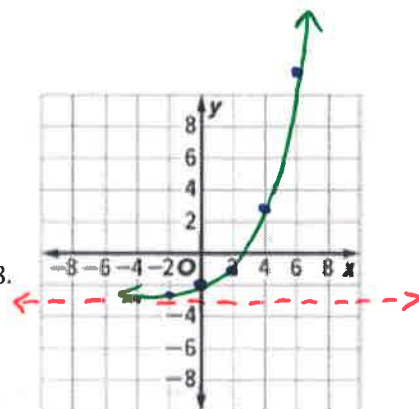
$$\frac{35 + 7\sqrt{2}}{23}$$

20. 6.6 Solve $\sqrt{2x + 5} + 1 = 8$.

$$x = 22$$

CHAPTER 7:

21. Graph $f(x) = 2^x - 3$.



Mande buys a new car for \$33,575. Her new car will lose 8% of its value the moment she drives it off the dealership's lot. At the end of each year after, the car will have lost an additional 15% of its value.

22. **Part A:** Write the equation that best models the value of Mande's car.

$$A = [33575(1 - .08)](1 - .15)^t \quad \text{OR} \quad A = [33575(1 - .08)]e^{-.15t}$$

23. **Part B:** Use your equation from Part A to predict the value of the car after 5 years.

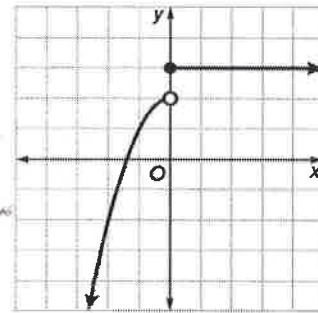
$A =$ ANSWERS BETWEEN \$13500 - \$15000 ARE ACCEPTABLE.

24. Solve the equation for x : $16^{3x+7} = 64^{8-x}$

$$x = \frac{10}{9}$$

25. Using graph, Solve $f(x) = g(x)$, where $f(x)$ is shown and $g(x) = 2e^x + 1$.

$$x = 0$$



26. Simplify $(\frac{1}{3}e^{2x})^2 = \frac{1}{9}e^{4x}$

27. The growth in revenue r in billions of dollars of one of America's largest corporations can be modeled by the function $r(x) = 9.13(1.29)^x$, where x is years since 2005. Assume that the revenue continues to grow at the same rate. To the nearest billion dollars, what can you estimate their revenue will be in 2020.

ABOUT \$416 BILLION

28. Which regression equation best fits this data

x	-5	-4	-3	-2	-1	0	1	2	3	4
y	-3	-2.7	-2.4	-2	-1	0	2.8	8	17.2	31

$$r^2 = .958$$

$$\text{Eqn: } y = .73x^2 + 3.84x + .5$$

QUADRATIC IS ALSO PRETTY GOOD

DEFINITELY EXPONENTIAL

BUT TRICKY.

$$r^2 \approx .969$$

$$y = 5.42(1.488)^x - 4$$

CHAPTER 8:

29. Suppose $f(x) = \log_3(x^2 - 4)$. For what positive value of x does $f(x) = 2$?

$$x = \pm \sqrt{13}$$

30. Solve $2 \log(x) - \log(4) = \log(3) + \log(12)$.

$$x = 12$$

31. The value of $\log(3745)$ is between what two integers?

3 AND 4

32. Solve the equation $\log_{27} x = \frac{2}{3}$

$$x = 9$$

33. Connor deposits \$500 into a savings account earning 1.25% compound continuously. After 3 years, how much money will be in the savings account? Use $A = Pe^{rt}$.

ABOUT \$520

34. The function $y = 0.94(1.2)^x$ models the percent of accidents y due to fatigue as a function of the number of hours of driving x since an 8-hour break. To the nearest tenth, how many hours of driving would it take for the accident rate to be 40%.

ABOUT 20.6 HOURS OF DRIVING SINCE AN 8-HOUR BREAK.

CHAPTER 9:

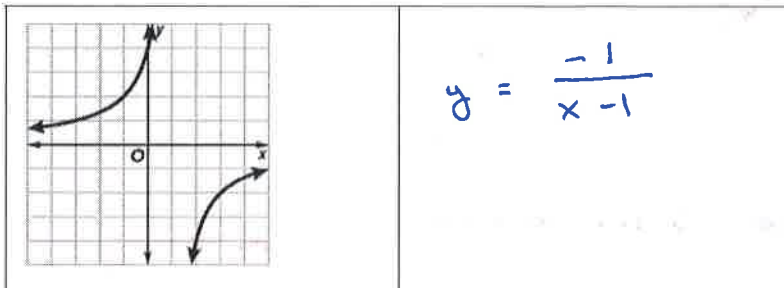
35. Simplify $\frac{a^2-9}{a^2-3a} \div \frac{a^2-2a-8}{a^2+4a+4}$

$$\frac{(a+3)(a+2)}{a(a-4)} \quad \text{or} \quad \frac{a^2+5a+6}{a^2-4a}$$

36. Simplify $\frac{15t+1}{3t} - \frac{3t}{t}$

$$\frac{6t+1}{3t}$$

37. The graph of a function is shown, write the function of this graph.



38. Find the domain of $f(x) = \frac{x-1}{x^2+6x-16}$.

Domain: $\mathbb{R}, x \neq -8, 2$

39. Which statement is true about $f(x) = -\frac{x^2-3x-4}{x+1}$?

I. The graph of $f(x)$ has two x-intercepts. NO

II. The graph of $f(x)$ is the same as the graph of $f(x) = x - 4$.

SIMILAR, BUT NOT EXACTLY (DISCONTINUITY AT POINT $(-1, +5)$)

III. The range of f is the set of all real numbers.

NO, $y \neq 5$

40. If y varies inversely as the square root of x , what is the constant of proportionality if $y = 36$ when $x = 6$?

$$K = 36\sqrt{6}$$

41. Solve $\frac{x}{x+3} - \frac{5}{x-4} = 1$.

$$x = -\frac{3}{8}$$