Algebra II - Chapter 9 Test Review

Please do all work on a separate paper.
REVIEWS ARE REQUIRED FOR RETEST ELIGIBILITY.
NO LATE REVIEWS ACCEPTED **** no calculator allowed***

Find <u>all 3</u> roots of the polynomial equation.

1. $x^3 - 2x^2 + 5x - 10 = 0$ *(ex 2, pg 348)*

***Rationalize the denominator of the expression. Assume that all variables are positive.**

*2. $\dfrac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$ *(ex.6 pg 388)*

*3. $\dfrac{2 + \sqrt[3]{3}}{\sqrt[3]{6}}$ *(ex5 pg382)*

*4. **Graph** $y = 7(6)^{x+2} + 1$ *(ex 2 pg448)*

Evaluate each logarithm, *(ex 3 pg 455)*

5. $\log_5 \dfrac{1}{625}$

6. $\log_3 243$

Is the relationship between the variables in the table a direct variation, an inverse variation, or neither? If it is a direct or inverse variation, write a function to model it. *(ex 2 pg 497)*

7.

x	6	10	11	15
y	84	140	154	210

8.

x	–5	–1	4	7
y	16	8	–2	–8

9.

x	–7	–5	–2	–1
y	$39.\overline{7}$	$39.\overline{5}$	$39.\overline{2}$	39

10.

x	–7	–3	1	2
y	–4	$-28.\overline{3}$	28	14

Describe the combined variation that is modeled by the formula or equation. *(ex 4 pg498)*

*11. $y = \dfrac{w}{2x^2}$

***Graph the function.** *(ex2 pg504)*

*12. $y = \dfrac{-2}{x}$

Sketch the asymptotes and graph the function. *(ex 4 pg 505)*

*13. $y = \dfrac{2}{x + 2} - 3$

(ex 5 pg 506)

*14. Write an equation for the translation of $y = \dfrac{7}{x}$ that has the asymptotes $x = 6$ and $y = -4$.

*15. Write an equation for the translation of $y = \dfrac{-1}{x}$ that has the asymptotes $x = 2$ and $y = -1$.

Find any points of discontinuity for the rational function. Identify these points as vertical asymptote(s) and/or hole(s). *(ex 2 pg 511, ex3 pg 512)*

*16. $y = \dfrac{(x+6)(x+2)(x+8)}{(x+9)(x+7)}$

*17. Describe the vertical asymptote(s) and hole(s) for the graph of $y = \dfrac{(x-5)(x-2)}{(x-2)(x+4)}$.

*18. Find the horizontal asymptote of the graph of $y = \dfrac{6x^2+5x+9}{7x^2-x+9}$.

Simplify the rational expression. State any restrictions on the variable.*(ex 1,2 pg 517-518)*

19. $\dfrac{q^2+11q+24}{q^2-5q-24}$

Multiply or divide. State any restrictions on the variables. *(ex 3,4 pg 518-519)*

20. $\dfrac{x^2-16}{x^2+5x+6} \div \dfrac{x^2+5x+4}{x^2-2x-8}$

21. $\dfrac{8x^4}{y^2} \cdot \dfrac{4y^6}{9x^6}$

22. $\dfrac{c^2}{c+4} \cdot \dfrac{c^2-c-20}{c^2+1c}$

23. $\dfrac{b-4}{b-2} \div \dfrac{b+6}{b^2+3b-10}$

Add or subtract. Simplify if possible. *(Ex 3,4 pg 532-524)*

24. $\dfrac{w^2+2w-24}{w^2+w-30} + \dfrac{8}{w-5}$

25. $\dfrac{a^2-2a-3}{a^2-9a+18} - \dfrac{a^2-5a-6}{a^2+9a+8}$

26. $\dfrac{2}{n-7} + \dfrac{3}{n^2-49}$

27. $\dfrac{m^2-12m+32}{m^2-4m-32} - \dfrac{3}{m+4}$

***Simplify the complex fraction.** *(ex 5 pg524)*

*28. $\dfrac{\frac{3}{4y} - \frac{2}{y}}{\frac{1}{y} + \frac{3}{2y}}$

*29. $\dfrac{\frac{q-1}{q^2+10q+24}}{\frac{q+8}{q+4}}$

Solve the equation. Check the solution.*(ex1 pg 530)*

*30. $\dfrac{-2}{x+4} = \dfrac{4}{x+3}$

(ex 1,2 pg 531-532)

*31. Shelley can paint a fence in 8 hours. Karen can do it in 4 hours. Write an equation that can be used to find how long it will take them working together to paint the fence. How many hours will it take them to paint the fence together? Leave your answer as a fraction.

*32. The sum of two consecutive odd integers is 116. Write an equation that can be used to find the two integers. Find the two integers

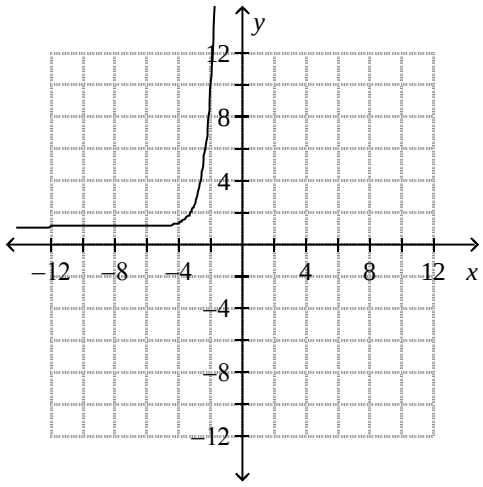
33. Model Cars and More, Inc., found that the number *N* of model cars sold varies directly with their advertising budget *A* and inversely with the price *P* of each car. The company sold 8000 cars when $14,000 was spent on advertising and the price of a car was set at $20. Determine the number of cars sold when the amount spent on advertising is increased to $46,000. Round to the nearest whole number.

34. The physics club is planning a bus trip to New Mexico to watch the Hot Air Balloon Festival. The cost per person for the bus rental varies inversely as the number of people going on the trip. It will cost $45 per person if 29 people go on the trip. How much will it cost per person if 36 people go on the trip? Round your answer to the nearest cent, if necessary.

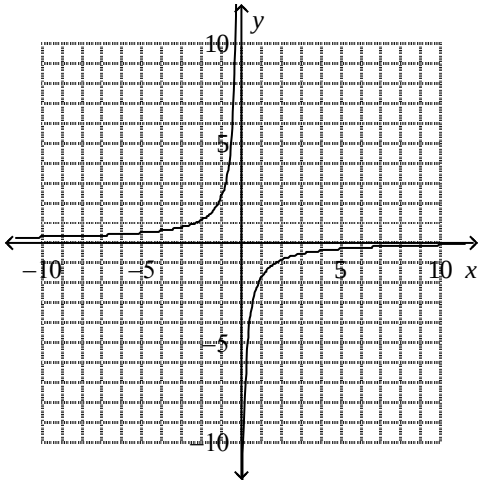
35. If *R* is the total resistance for a parallel circuit with two resistors of resistances r_1 and r_2, then $\frac{1}{R} = \frac{1}{r_1} + \frac{1}{r_2}$. Find the resistance r_1 if the total resistance *R* is 55 ohms and r_2 is 80 ohms. Round your answer to the nearest ohm if necessary.

Chapter 9 Review Answers

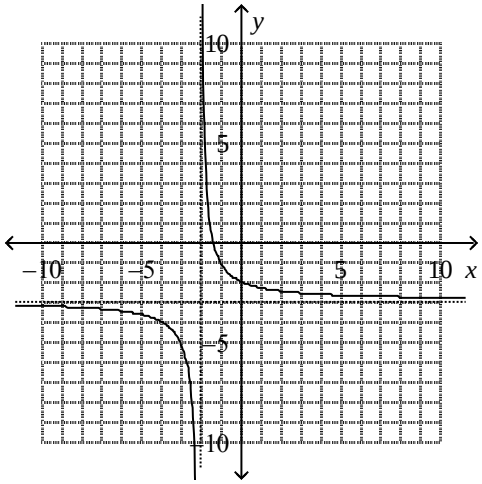
1. ANS:
   2, $\pm i\sqrt{5}$
2. ANS:
   $-3 + 2\sqrt{2}$
3. ANS:
   $\frac{2\sqrt[3]{36} + 3\sqrt[3]{4}}{6}$
4. ANS:



5. ANS:
   –4
6. ANS:
   5
7. ANS:
   direct variation; $y = 14x$
8. ANS:
   neither
9. ANS:
   inverse variation; $y = \frac{-39}{x}$
10. ANS:
    inverse variation; $y = \frac{28}{x}$
11. ANS:
    y varies directly as *w* and inversely as the square of *x*.
12. ANS:



13. ANS:



14. ANS:
    $y = \frac{7}{x - 6} - 4$
15. ANS:
    $y = \frac{-1}{x - 2} - 1$
16. ANS:
    $x = -9, x = -7$
17. ANS:
    asymptote: $x = -4$ and hole: $x = 2$
18. ANS:
    $y = \frac{6}{7}$
19. ANS:
    $\frac{q + 8}{q - 8}; q \neq -3, q \neq 8$

20. ANS:
$\frac{(x-4)^2}{(x+3)(x+1)}; x \neq -4, -3, -2, -1, 4$

21. ANS:
$\frac{32y^4}{9x^2}, x \neq 0, y \neq 0$

22. ANS:
$\frac{c^2-5c}{c+1}, c \neq -4, 0, -1$

23. ANS:
$\frac{(b-4)(b+5)}{b+6}, b \neq 2, -6$

24. ANS:
$\frac{w+4}{w-5}$

25. ANS:
$\frac{21a-28}{(a-6)(a+8)}$

26. ANS:
$\frac{2n+17}{(n-7)(n+7)}$

27. ANS:
$\frac{m-7}{m+4}$

28. ANS:
$-\frac{1}{2}$

29. ANS:
$\frac{q-1}{(q+8)(q+6)}$

30. ANS:
$-\frac{11}{3}$

31. $\frac{x}{8}+\frac{x}{4}=1; 2\frac{2}{3}$ hours (2.67 hr.)

32. x+ x+ 2= 116; 57 and 59

33. 26,286 cars

34. $36.25

35. 176 ohms