Name ______________________________ Block _____ Date ____________

Chapter 5 Review

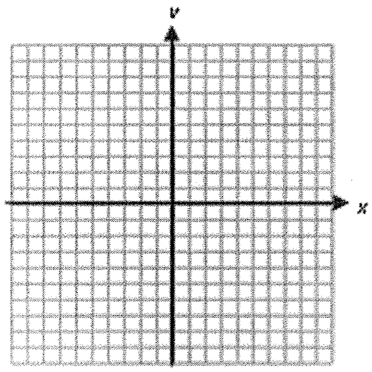
NON-CALCULATOR

On a separate piece of paper, thoroughly explain each of the following terms within the context of this chapter:

Combined variation
Constant of variation
Cube root function
Direct variation
Extraneous solution
Hyperbola
Inverse variation
Joint variation
Radical equation
Radical function
Radical inequality
Rational equation
Rational exponent
Rational function
Rational inequality
Square root function

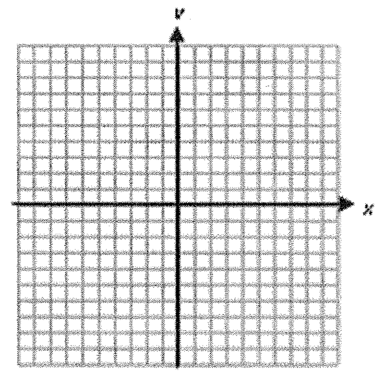
Given that y varies directly as x, write and graph each direct variation function.

1. $y = 2$ when $x = 6$



Equation: ____________________

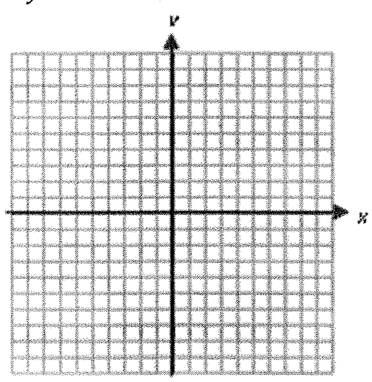
2. $y = 4$ when $x = 1$.



Equation: ____________________

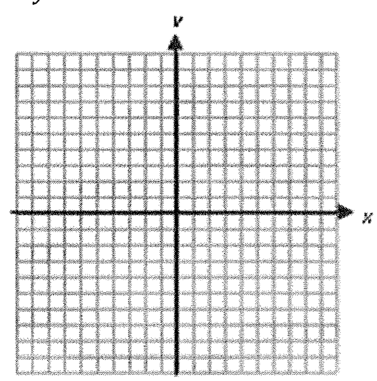
Given that y varies inversely as x, write and graph each inverse variation function.

3. $y = 3$ when $x = 2$



Equation: ____________________

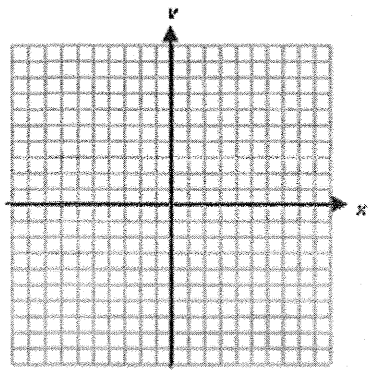
4. $y = 4$ when $x = 1$



Equation: ____________________

Using the graph of $f(x)=\frac{1}{x}$ as a guide, describe the transformation and graph each function. Then, identify the asymptotes, domain and range of each function.

5. $f(x)=\frac{1}{x-4}$



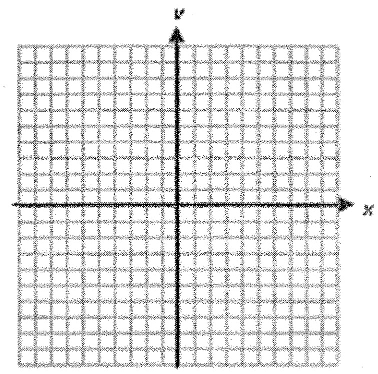
Description:

Asymptotes: ____________________

Domain: ________________________

Range: _________________________

6. $f(x)=\frac{3}{x+3}+1$



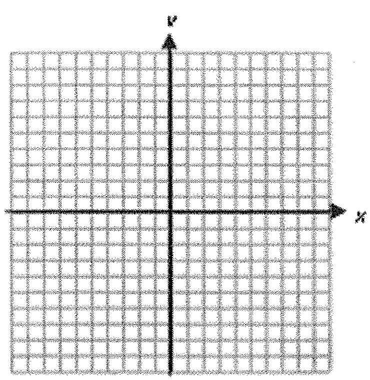
Description:

Asymptotes: ____________________

Domain: ________________________

Range: _________________________

7. $f(x)=\frac{-2}{x-1}-3$



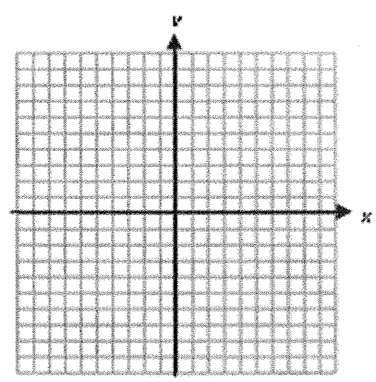
Description:

Asymptotes: ____________________

Domain: ________________________

Range: _________________________

8. $f(x)=\frac{1}{x-2}+3$



Description:

Asymptotes: ____________________

Domain: ________________________

Range: _________________________

Divide each rational function in order to rewrite it in transformation form. Then, describe the transformation.

9. $f(x) = \dfrac{4x-5}{x-1}$

Transformed Form: ______________________

Description:

10. $g(x) = \dfrac{2x+10}{x+4}$

Transformed Form: ______________________

Description:

Solve each equation.

11. $\dfrac{3x}{x+2} = \dfrac{2x+2}{x+2}$

12. $\dfrac{4x}{x-5} = \dfrac{3x+5}{x-5}$

13. $x - \dfrac{6}{x} = 1$

14. $\dfrac{x}{x+4} + \dfrac{x}{2} = \dfrac{2x}{x+4}$

Simplify each expression. Assume that all variables are positive.

15. $\sqrt[3]{27x^6}$

16. $\sqrt[4]{81x^{12}}$

17. $\sqrt[3]{\dfrac{8x^3}{3}}$

Write each expression using radical exponents.

18. $(\sqrt[3]{-27})^2$

19. $\sqrt[4]{16^3}$

20. $(\sqrt{9})^3$

Simplify each expression.

21. $17^{1/3} \cdot 17^{2/3}$

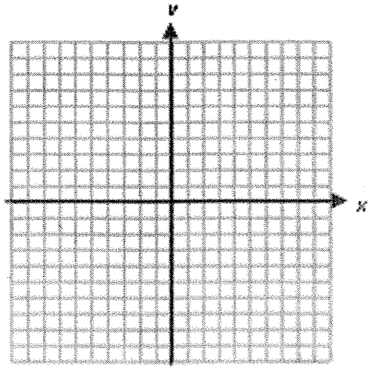
22. $(9^4)^{1/2}$

23. $\left(\dfrac{1}{16}\right)^{1/4}$

24. $\left(\dfrac{8}{27}\right)^{1/3}$

Using the graph of $f(x)=\sqrt{x}$ or $f(x)=\sqrt[3]{x}$ as a guide, describe the transformation and graph each function. Then, identify the domain and range.

25. $f(x)=\sqrt{x+3}+5$



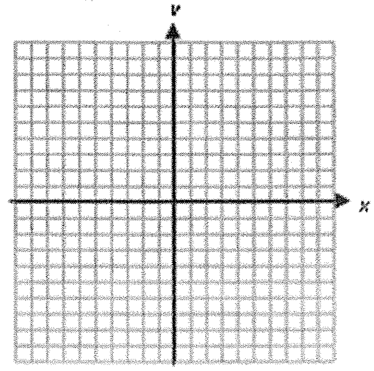
Description:______________________________

____

Domain:_______________

Range:_______________

26. $h(x)=\sqrt{-4(x+2)}$



Description:______________________________

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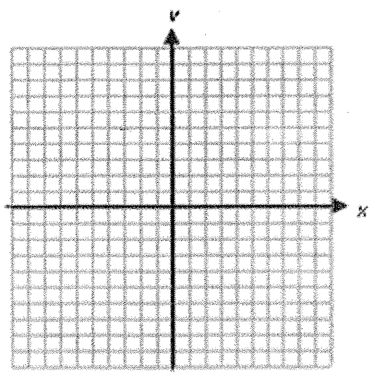
Domain:_______________

Range:_______________

27. $g(x)=-\sqrt[3]{x}+1$



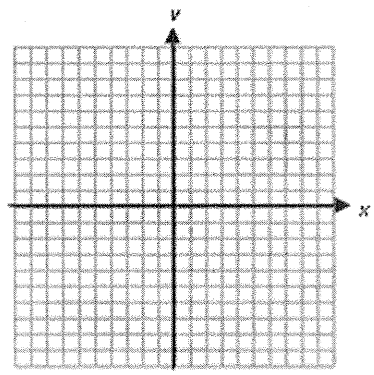
Description:______________________________

____

Domain:_______________

Range:_______________

28. $f(x)=4\sqrt[3]{x-2}$



Description:______________________________

____

Domain:_______________

Range:_______________

29. Write the transformed function. The parent function $f(x)=\sqrt{x}$ is stretched vertically by a factor of 3 and translated 4 units left.

30. Write the transformed function. The parent function $f(x)=\sqrt[3]{x}$ is reflected across the y-axis, is compressed horizontally by a factor of 2, and translated 1 unit up.

Solve each equation.

31. $\sqrt{x+6}-7=-2$

32. $\frac{\sqrt[3]{2x-2}}{6}=1$

33. $\sqrt{10x}=3\sqrt{x+1}$

34. $2\sqrt[5]{x}=\sqrt[5]{64}$

35. $\sqrt{x+1}=x-5$

36. $(4x+7)^{\frac{1}{2}}=3$

37. $(x-4)^{\frac{1}{4}}=3$

38. $x=(2x+35)^{\frac{1}{2}}$

39. $(x+3)^{\frac{1}{3}}=-6$

CALCULATOR

40. The number of tiles needed *n* to cover a floor varies directly as the area *a* of the floor, and $n = 180$ when $a = 20$ ft^2. Write an equation for this situation. Then, find the number of tiles when $a = 34$ ft^2.

41. For a fixed voltage, the current, I flowing in a wire varies inversely as the resistance *R* of the wire. If the current is 8 amperes when the resistance is 15 ohms, write an equation for this situation. Then, find the resistance when the current is 5 amperes.

42. Determine whether the data set represents direct variation, inverse variation, or neither.

x	2	5	10
y	25	10	5

43. Given that *y* varies directly with *x* and inversely with *z*, complete the following table.

x	y	z
2.5	75	6
	120	7.5
5		100
12	90	

44. The simple interest, I earned over a particular period of time varies jointly as the principal, P, and rate, r. If I = \$264 when P = \$1100 and $r = 0.12$, write an equation for this situation. Then, find P when I = \$360 and $r = 0.09$.

Solve each inequality.

45. $\frac{x+4}{x} > -2$

46. $\frac{2}{x-3} < 4$

47. $\sqrt{x-4} \leq 3$

48. $\sqrt{2x+7} - 6 > -1$

49. $\sqrt[3]{x-1} > -2$

50. A tetrahedron is a triangular pyramid with four congruent faces. The side length s in meters of a tetrahedron is given by the formula $s = (6V\sqrt{2})^{1/3}$. Solve this equation for V.

51. The time T in seconds required for a pendulum to complete one back-and-forth swing can be determined from the formula $T = 2\Pi\sqrt{\frac{L}{9.8}}$, where L is the length of the pendulum in meters. Solve this equation for length of a pendulum in terms of time. Then, use the equation to estimate the length of a pendulum that completes one back-and-forth swing in 2.5 seconds.