Name _____ **Period** _____ **Date** _____

Algebra 2 –3rd Quarter Review

Functions:

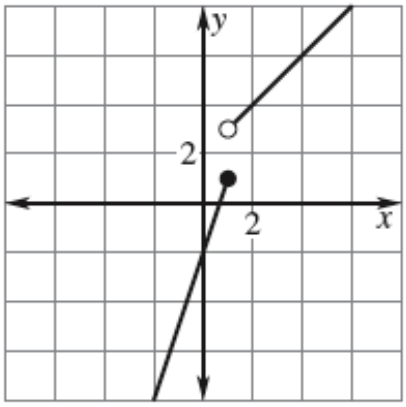
In 1& 2 Graph. State the vertex, domain & range.

1. $f(x)=|x+2|-2$

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

3. Graph $f(x)=\begin{cases}-x-4, & \text{if } x<-1\\ 2x+1, & \text{if } x\geq -1\end{cases}$

4. Write a piecewise function for the graph below



5. A cell phone company only charges you for your data use as shown below:

Data used	Rate per month
0 – 2 GB	$20
Over 2 GB – 4 GB	$40
Over 4 GB – 6 GB	$60
Over 6 GB – 8 GB	$80
Over 8 GB – 10 GB	$100

Graph the data plan.

6. If $f(x)=x^2-3$ and $g(x)=4\sqrt{x}$, find $f\left(g(x)\right)$, and $f\left(f(x)\right)$.

7. Let $f(x)=4x+1$ and $g(x)=x^2-5$. Find $f\left(g(x)\right)$ and $g\left(f(x)\right)$.

Find the inverse of the function.

8. $f(x)=-\frac{1}{3}x-7$ Verify answer using composition

9. $f(x)=x^3+3$

10. $g(x)=\sqrt{4x-9}$

11. $f(x)=\frac{x^2+2}{7}$ Verify answer using composition

12. Let $f(x)=3x$. Find f^{-1}.

13. The table below lists coordinate pairs for points on the graph of a function f(x). Find $f^{-1}(4)$?

x	y
-4	-11
1	4
4	13

14. The table below lists coordinate pairs for points on the graph of a function f(x) & g(x). Find $g\left(f(-1)\right)$.

X	$f(x)$
-1	-9
0	-1
2	7

x	$g(x)$
-9	6
0	2
-1	2

Radicals:

In 15 – 17:

a. Describe how the parent function $f(x)=\sqrt{x}$ is transformed.
b. State the domain and range of the function
c. Sketch the graph.

15. $g(x)=-\frac{1}{2}\sqrt{x-3}-2$

16. $g(x)=-3\sqrt{x-2}+5$

17. $g(x)=4\sqrt{x+5}-3$

Radicals:

Solve.

18. $\sqrt{2x+2}-10=-4$

19. $x=\sqrt{20-x}$

20. $\sqrt{2x-8}=\sqrt{10-x}$

21. $-15\sqrt{4x+1}+7=52$

Solve. Round to 3 decimals if needed.

22. $3(x+1)^6+5=98$

23. $8x^5+4=-252$

24. $(3x-8)^7=25$

Simplify:

25. $\dfrac{\sqrt[3]{2}}{\sqrt[3]{54}}$

26. $\left(\dfrac{1}{16}\right)^{1/2}$

27. $\dfrac{\sqrt[5]{9}\cdot\sqrt[5]{81}}{\sqrt[5]{3}}$

28. $\left(\dfrac{r^{25}}{s^{10}}\right)^{2/5}$

29. $\left(5^{4/5}\cdot 5^{4/5}\right)^{-10}$

30. $\dfrac{49^{5/6}}{49^{1/3}}$

31. $x^{1/3}\cdot x^{1/4}$

32. $\sqrt{64x^{12}}$

33. $\sqrt[4]{720x^5y^{10}z^{15}}$

Rational Functions:

Simplify the following expressions & state the domain restriction.

34. $\dfrac{n^2+8n+15}{n^2-25}$

35. $\dfrac{x^3+4x^2}{x^2-16}$

Simplify the following expressions & state the domain restriction.

36. $\dfrac{2x^3-14x^2}{(x+1)^2}\cdot\dfrac{x^2-8x-9}{6x^2-42x}$

37. $\dfrac{x^2+7x+12}{x^2-9}\div\dfrac{x+4}{x-4}$

38. $\dfrac{5x^2-13x+9}{x^3-5x^2+6x}-\dfrac{x^2-2x+3}{x^3-5x^2+6x}$

39. $\dfrac{2x+7}{x^2+5x+4}-\dfrac{x+6}{x^2+5x+4}$

40. $\dfrac{4v+5}{18v^3+30v^2}+\dfrac{5v-5}{18v^3+30v^2}$

41. $\dfrac{3x+4}{x^2-16}-\dfrac{2}{x-4}$

42. $\dfrac{5}{x+9}+\dfrac{6}{x-9}$

A. $\dfrac{11x+9}{11}$ B. $\dfrac{11}{x^2-81}$ C. $\dfrac{11x+9}{x^2-81}$ D. $\dfrac{11}{x+9}$

43. $\dfrac{x+1}{x^2+6x+9}-\dfrac{1}{x^2-9}$

44. $3+\dfrac{x-6}{3x^2+11x-4}$

Solve:

45. $\dfrac{x}{3}-\dfrac{x}{6}=3$

46. $\dfrac{x^2}{x-5}=\dfrac{25}{x-5}$

47. $\dfrac{1}{x^2+3x}=1+\dfrac{3}{x^2+3x}$

48. $\dfrac{1}{x-4}=\dfrac{5}{x^2-10x+24}-\dfrac{1}{x-6}$

Solve. What is the <u>sum</u> of the solutions?

49. $\dfrac{m}{m-1}+\dfrac{m}{m-9}=1$