Algebra II
Absolute Value, Piecewise and Radical Functions Review

Solve the following absolute value equations algebraically. Circle or box your answer.

1. $|9x - 2| = 7$	2. $|2x - 4| = 6x$	3. $|-5x + 1| = -3$

Solve the following absolute value inequalities. Graph the solution set.

4. $|x - 2| < 4$	5. $|2x + 3| \geq 1$
Solution: _____	Solution: _____
6. $\left|\dfrac{1}{4}x + 3\right| \leq 1$	7. $|8x - 5| > -3$
Solution: _____	Solution: _____

Identify the <u>vertex</u> of the function, tell whether the function opens *up* or *down*, and tell whether the graph is *wider*, *narrower*, or the *same* width as the graph of f(x) = |x|.
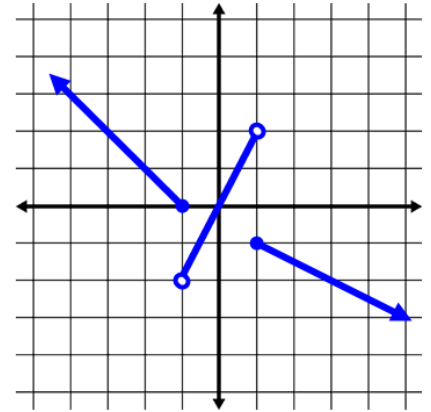
8. f(x) = 3|x|+2   Vertex: (,   )   Opens:_____   Width: _____

9. g(x)= -|x + 1|-5   Vertex: (,   )   Opens:_____   Width: _____

10. $h(x) = \dfrac{1}{2}|x - 3|$ Vertex: (,   )   Opens:_____   Width: _____

11. **Analyze the characteristics of the function shown in the graph.**
    a.   domain: _____

    b.   range: _____

    c.   x-intercept(s): _____   y-intercept: _____

    d.   x-coordinate of point(s) of discontinuity: _____

    e.   interval of increase: _____

    f.   interval of decrease: _____

    g. Equation:
$$f(x) = \begin{cases} \underline{\hspace{3cm}} \\ \\ \underline{\hspace{3cm}} \\ \\ \underline{\hspace{3cm}} \end{cases}$$

Use the function $f(x) = \begin{cases} 3x+2, & x \le 3 \\ x-1, & x > 3 \end{cases}$ **to evaluate the following:**
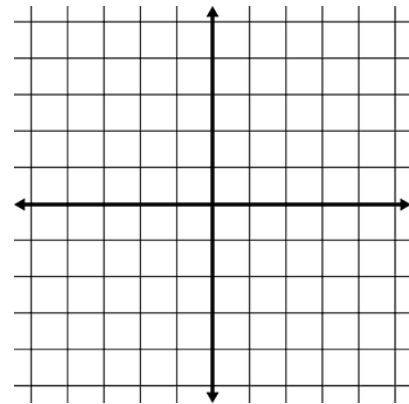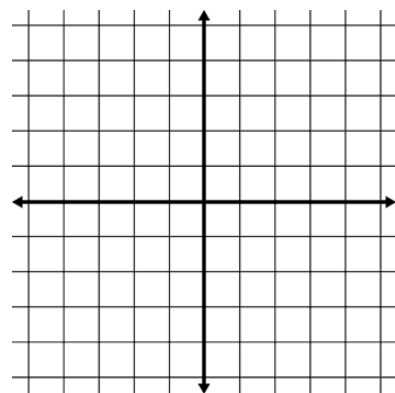
12. $f(5) =$ _____

13. $f(0) =$ _____

14. $f(3) =$ _____

Graph the following piece-wise defined function:

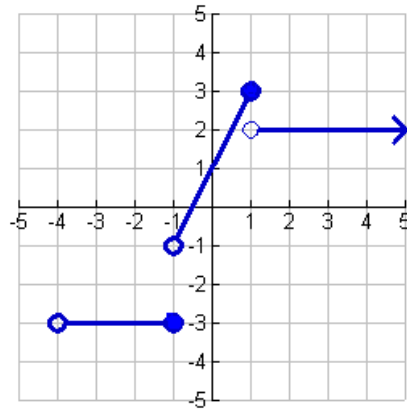15. $f(x) = \begin{cases} -1 & if\ -5 \le x < -2 \\ 1 & if\ -2 \le x < 1 \\ 3 & if\ 1 \le x < 3 \end{cases}$

16. $f(x) = \begin{cases} -x-2 & x \le -2 \\ x-1 & -2 < x < 2 \\ \dfrac{1}{2}x-3 & x \ge 2 \end{cases}$

17. Write the equation for the **piecewise function** whose graph is shown. Include the appropriate restrictions on the domain.

$$f(x) = \begin{cases} \underline{\hspace{4cm}} \\ \underline{\hspace{4cm}} \\ \underline{\hspace{4cm}} \end{cases}$$

Solve.

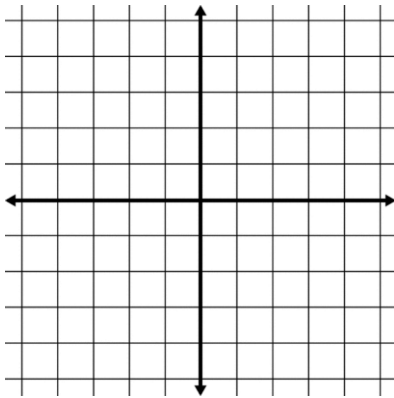18. $\sqrt{5x-4} + 2 = x$

19. $\sqrt[3]{5x-8} = \sqrt[3]{12-3x}$

20. $(7p-1)^{\frac{1}{3}} + 11 = 7$

Graph the following functions and tell the transformations for each.
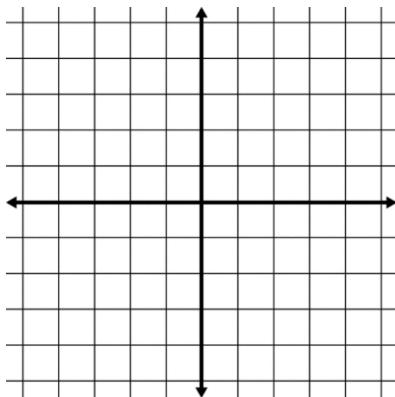
21. $f(x) = 2\sqrt{x-3} + 2$

(h,k):

Starting Pt:	Inc or Dec:
Domain:	Range:
Abs. Max or Abs Min:	
End Behavior: X → ____ , f(x) → ____ X → ____ , f(x) → ____	

22. y = -3$\sqrt[3]{x+2}$ + 2

(h,k):

Starting Pt:	Inc or Dec:
Domain:	Range:
Abs. Max or Abs Min:	
End Behavior: X → ____ , f(x) → ____ X → ____ , f(x) → ____	