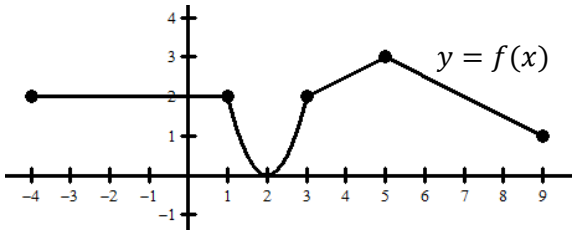
Math 3 Unit 2: Final Review **Name:**_____

Date:_____ **Per:**_____

1.



(a) State the open interval(s) on which *f* is increasing.
(b) State the open interval(s) on which *f* is decreasing.
(c) State the domain and range of *f*.
(d) State the coordinates of any relative minimums of *f*.
(e) State the coordinates of any relative maximums of *f*.
(f) Write a three pieced piecewise-defined function, *f*, that accurately represents the graph of *f* shown to the left.

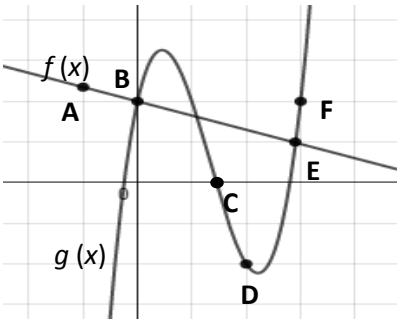
[2-5] Solve the following absolute value equations for *x* and graph the solution(s) on a number line. If there is no solution write '*none*' and explain why.

2. $|3x+2|+1=12$ 3. $-\left|\frac{x}{2}-5\right|=4$ 4. $\frac{2}{5}|3x+2|=20$ 5. $3\left|\frac{x}{4}-10\right|=0$

[6-9] Solve the following absolute value inequalities for *x* and graph the solution(s) on a number line. If there is no solution write '*none*' and explain why. Write answer in interval notation.

6. $|3x-10|\le 2$ 7. $-2|x+1|<-10$ 8. $3\left|\frac{2x}{3}-1\right|+4<-2$ 9. $2+2|x-5|\ge 0$

10. The graph of $y = f(x)$ and $y = g(x)$ is shown in the graph below.



a) List all of the labeled points that are solutions for $g(x) = 0$.

b) List all of the labeled points that are solutions for $g(x) = f(x)$.

c) List all of the labeled points that are solutions for $x = 0$ on the graph of $f(x)$.

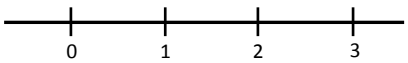
d) List all of the labeled points that are solution(s) for $g(x) < f(x)$ that are on $g(x)$.

e) List all of the labeled points that are solution(s) for $g(x) > f(x)$ that are on $g(x)$.

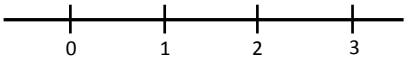
11. The table below shows several points on two continuous functions, $f(x)$ and $g(x)$.

x	0	1	2	3
$f(x)$	0	2	4	5
$g(x)$	–1	3	2	–2

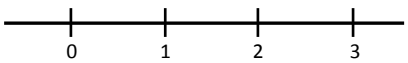
a) On the number line below, shade the interval(s) between the integers where the solution(s) to $f(x) = g(x)$ must exist. If solutions exist, also write your answer in interval notation. If no solutions must exist, explain why.



b) On the number line below, shade the interval(s) between the integers where the solution(s) to $g(x) = 0$ must exist. If solutions exist, also write your answer in interval notation. If no solutions must exist, explain why.

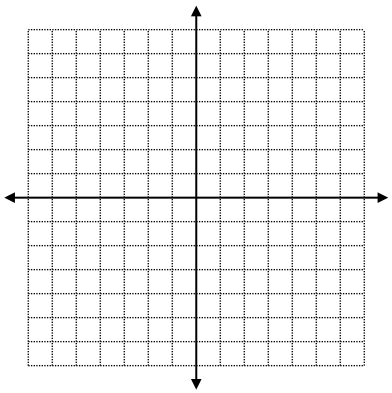


c) On the number line below, shade the interval(s) between the integers where the solution(s) to $f(x) = 3$ must exist. If solutions exist, also write your answer in interval notation. If no solutions must exist, explain why.

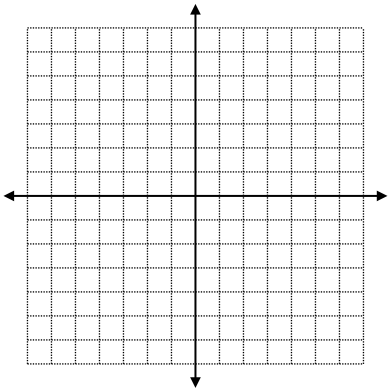


[12-14]Graph the system of inequalities on the graph provided.

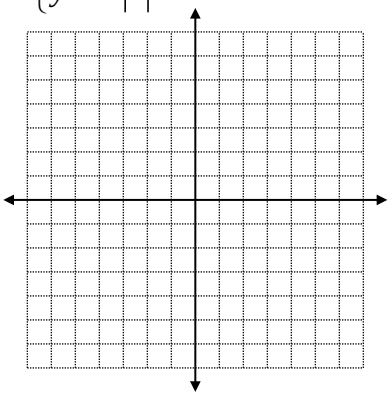
12. $\begin{cases} y \le 4 \\ y > x \end{cases}$



13. $\begin{cases} y > x^2 + 1 \\ y < 1 - x^2 \end{cases}$



14. $\begin{cases} y \le \frac{1}{3}|x+2| \\ y \ge -|x| \end{cases}$



[15-24] Solve the following quadratic equations for *x*. Simplify final result.

15. $2x^2 - 7x - 4 = 0$

16. $3x^2 = 11x + 4$

17. $(x+1)(x+5) = 3$

18. $x^2 + 4x - 21 = 0$

19. $x^2 + 2x + 5 = 0$

20. $(x+4)^2 - 5 = 6$

21. $2x^2 - 6x + 5 = 4$

22. $x(x-3) = 7$

23. $1 + 2(2x - 3)^2 = 17$

24. $(x + 2)^2 - 7 = 17$

25. $x^3 + 8 = 0$

26. If $f(x) = x - 1$ and $g(x) = x^2$, find $g(f(x))$.

27. If $g(x) = x + 3$ and $f(x) = |x|$, find $g(f(x))$.

28. If $f(x) = 2x + 1$ and $g(x) = x^2$, find $(g \circ f)(x)$.