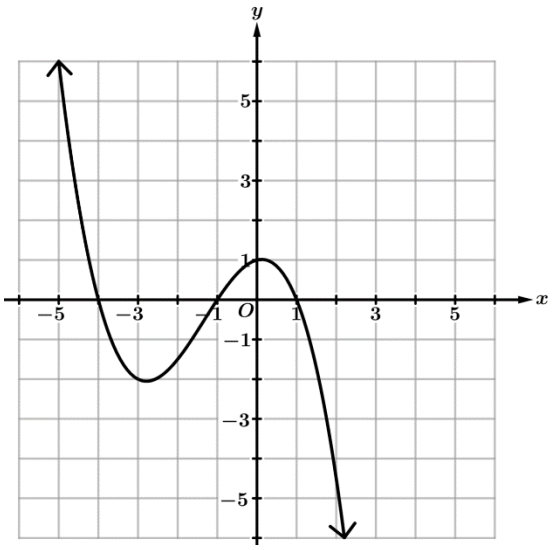
Worksheet C: (Topic 1.5) Polynomial Functions and Complex Zeros Name:

Directions: The graphs several polynomial functions are shown below. Use the graphs to find all intervals of x that satisfy the given conditions.

1.

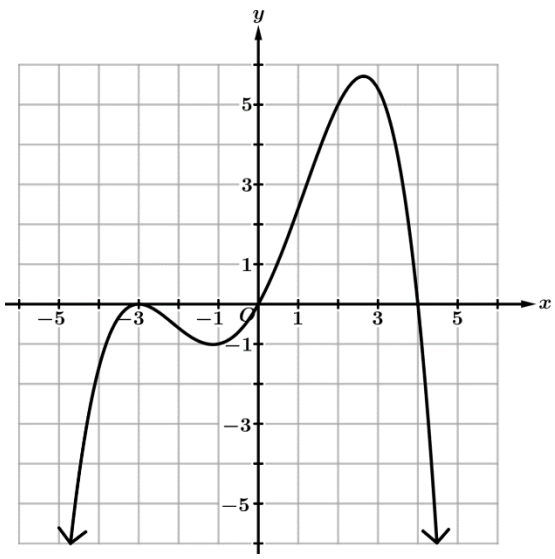


Graph of f

1a. $f(x) < 0$: _____

1b. $f(x) = 0$: _____

2.

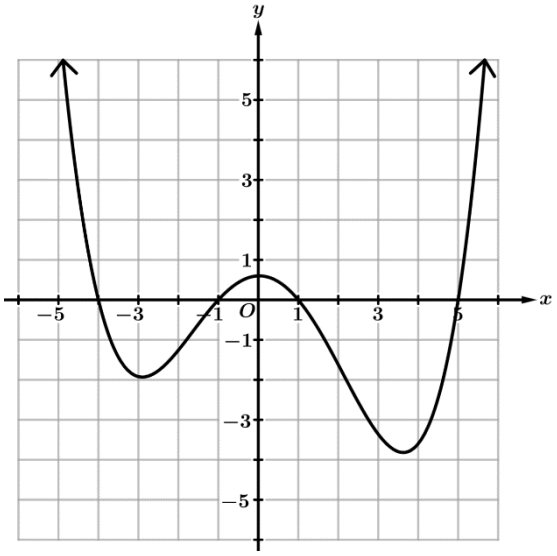


Graph of g

2a. $g(x) \le 0$: _____

2b. $g(x) > 0$: _____

3.

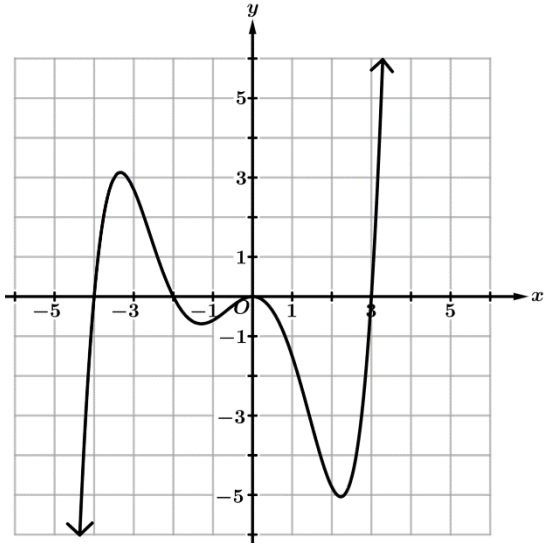


Graph of h

3a. $h(x) < 0$: _____

3b. $h(x) = 0$: _____

4.



Graph of k

4a. $k(x) \ge 0$: _____

4b. $k(x) < 0$: _____

Directions: Solve the following inequalities.

5. $3x(x+1)(x-2)<0$

6. $-2(x+3)(x-6)\geq 0$

7. $4(x-2)(x-7)^2\geq 0$

8. $-7x^2(x+4)^2>0$

9. $x(x+8)^2(x-3)\leq 0$

10. $(x+5)(x-1)(x-9)^2<0$

11. $-x(x+4)^2(x-2)^2\leq 0$

12. $x^3(x+7)(x-4)^2>0$

13. $x^2-2x-48\leq 0$

14. $(x^2-9)(x^2+2x-3)\geq 0$

Directions: Solve the following inequalities.

15. $x^3 - 8x^2 + 16x \geq 0$

16. $x^4 + 5x^3 < 0$

17. $x^2 + 5x > 8x + 18$

18. $x^2 - 7x < 5x - 36$

19. The function f is given by $f(x) = 2x^2 + 5x - 1$ and the function g is given by $g(x) = x^2 + x + 4$. Find all intervals where $f(x) \geq g(x)$.

20. The function h is given by $h(x) = x^4 - 6x^2$ and the function k is given by $k(x) = 3x^2$. Find all intervals where $h(x) > k(x)$.