INSTRUCTIONS: Simplify and box all your answers. Write neatly and justify all answers

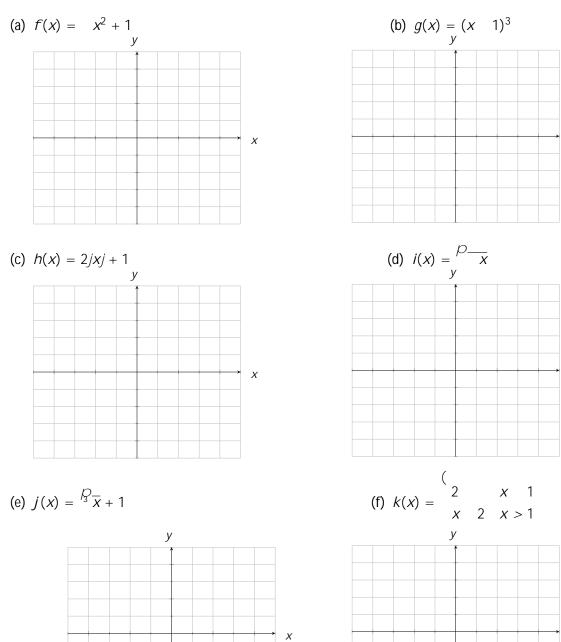
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1. Refer to the given graph of f(x) to answer the following: (9 pts)



- (a) Find the domain of f(x). Express your answer in interval notation
- (b) Find the range of f(x). Express your answer in interval notation
- (c) Find (f + f)(2)
- (d) Find  $(f \ f)(3)$
- (e) Find *jf*( 4)*j*
- (f) Solve f(x) = 3
- (g) Find

5. Sketch the graph of the following (graph each function on a **separate** set of axes). Label values on your axes: (19 pts)





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- 9. The points (1; 2) and (1; 4) lie directly opposite each other on a circle such that the distance between the two points gives the diameter of the circle. Answer the following: (9 pts)
  - (a) What is the radius of the circle?

(b) Where is the center of the circle?

- (c) Using the above, write down the equation of the circle in standard form
- 10. Find the inverse of the function  $f(x) = \frac{1}{2x^3} + 7$  (4 pts)

11. The small amount you put in your savings account a few years ago is growing rapidly(Yay!). Below is a graph of your balance A(t) in dollars, as a function 0 Td [(A)]TJ/s

- 13. The graph of a polynomial, P(x), has the following properties: (8 pts)
  - i. The graph has end behavior that is consistent with the end behavior of  $y = x^3$  (In arrow notation:  $P(x) \neq 7$  as  $x \neq 7$  and  $P(x) \neq 7$  as  $x \neq 7$ ).
  - ii. The graph crosses at *x*-intercept (2;0).
  - iii. The graph bounces (touches but does not cross) at *x*-intercept (1;0).
  - iv. The graph has no other *x*-intercepts.
  - v. The graph has *y*-intercept (0; 4).

Answer the following for P(x):

(a) Sketch a graph of P(x) that satisfies **all** of the given information.