

Name: \_\_\_\_\_

*Write solutions to the following problems on one side of the provided blank paper.*

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SECTION 1

1. (10 pts) Find the domain and range of the following relation ...

$$\{(1, 2), (2, 4), (3, 28), (4, 48)\}$$

2. (10 pts) Is the following relation a function?

$$\{(12, 2), (14, 3), (14, 6), (15, 8), (25, 2)\}$$

3. (10 pts) If  $f(x) = \sqrt{3x}$ , find  $f(3)$ .

4. (10 pts) If  $f(x) = x^{-3}$ , find  $f(4)$ .

## SECTION 2

5. (10 pts) Find where the domain is defined and find the range of the following function:

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

6. (10 pts) Find where the domain is defined and find the range of the following function:

$$h(x) = \sqrt{x+4}.$$

7. (10 pts) Find where the domain is defined and find the range of the following function:

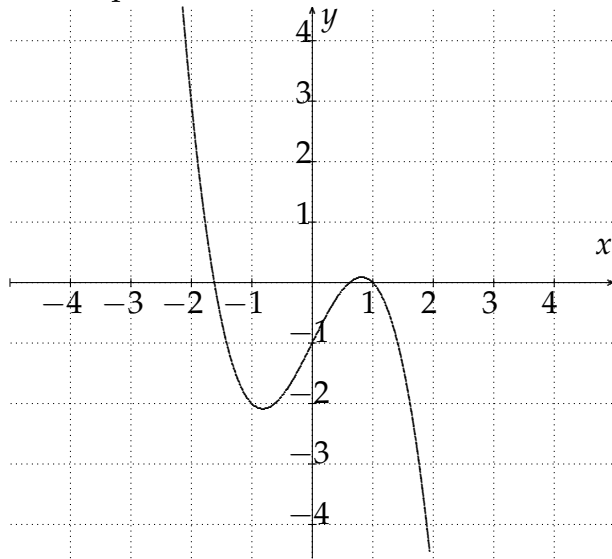
$$j(x) = 3x^2 + 4x.$$

## SECTION 3

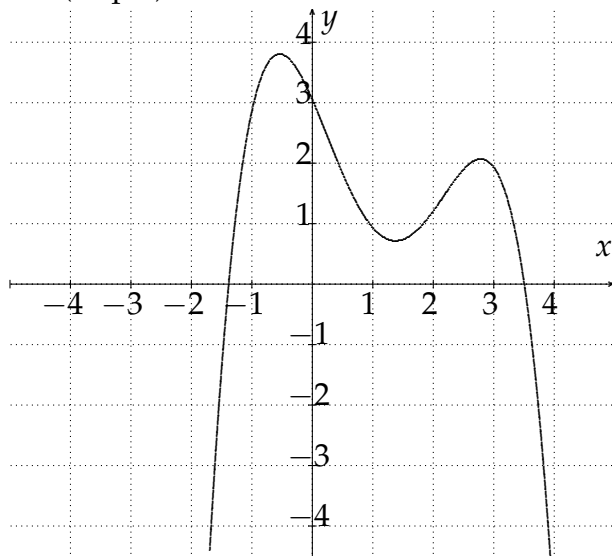
8. (10 pts) Write the following Interval in Set-Builder Notation:

$$(3, 26].$$

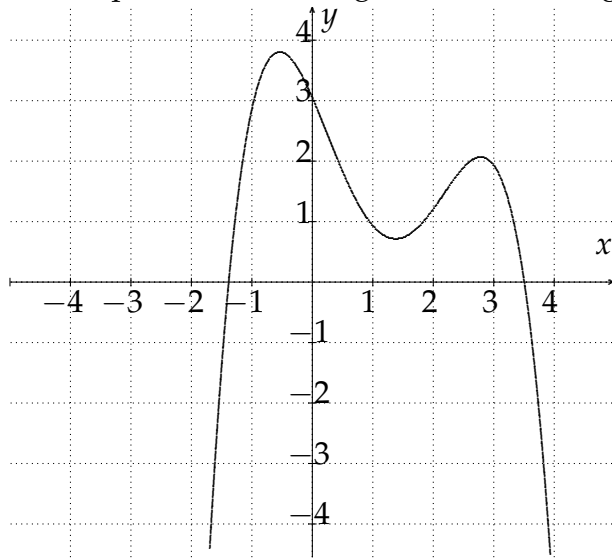
9. (10 pts) Find the local maxima and minima of the following graph:



10. (10 pts) Find the local maxima and minima of the following graph:



11. (10 pts) Find the range of the following graph:



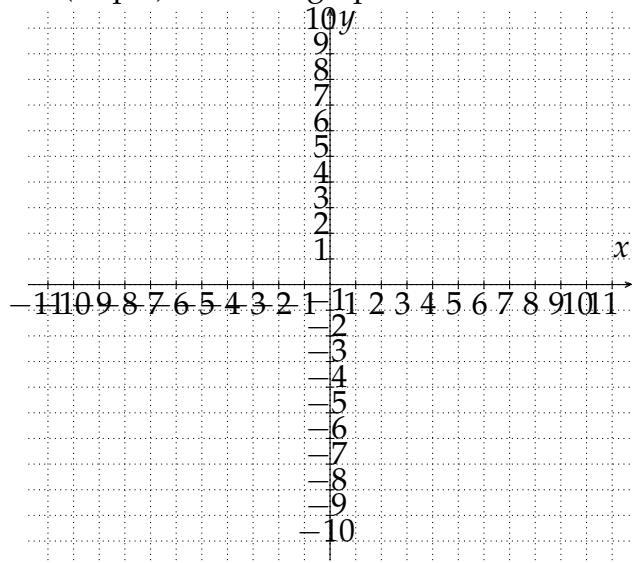
12. (30 pts) If  $f(x) = x^3 + 2x$  and  $g(x) = x^2$  find the following compositions:

1.  $(f + g)(x)$

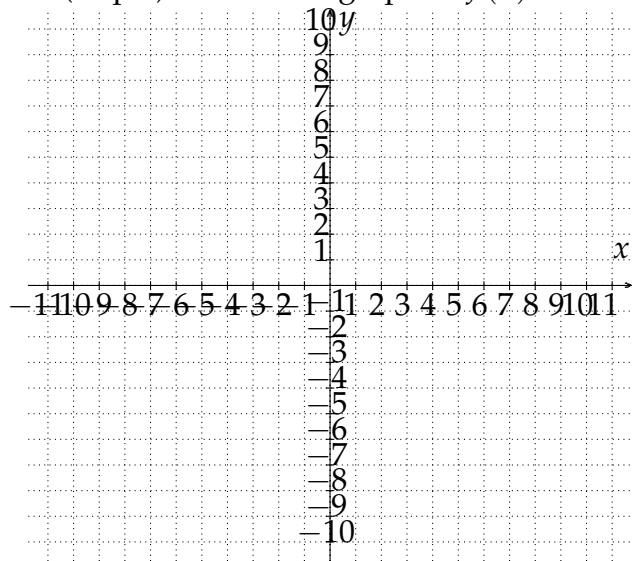
2.  $(\frac{f}{g})(x)$

3.  $(f \circ g)(x)$

13. (10 pts) Sketch a graph of  $x^2 - 3$ .



14. (10 pts) Reflect the graph of  $f(x) = x^3 - 1$  across the  $x$ -axis.



15. (10 pts) If  $f(x) = \frac{1}{x+2}$  and  $g(x) = \frac{1}{x} - 2$  does  $g = f^{-1}$ ?