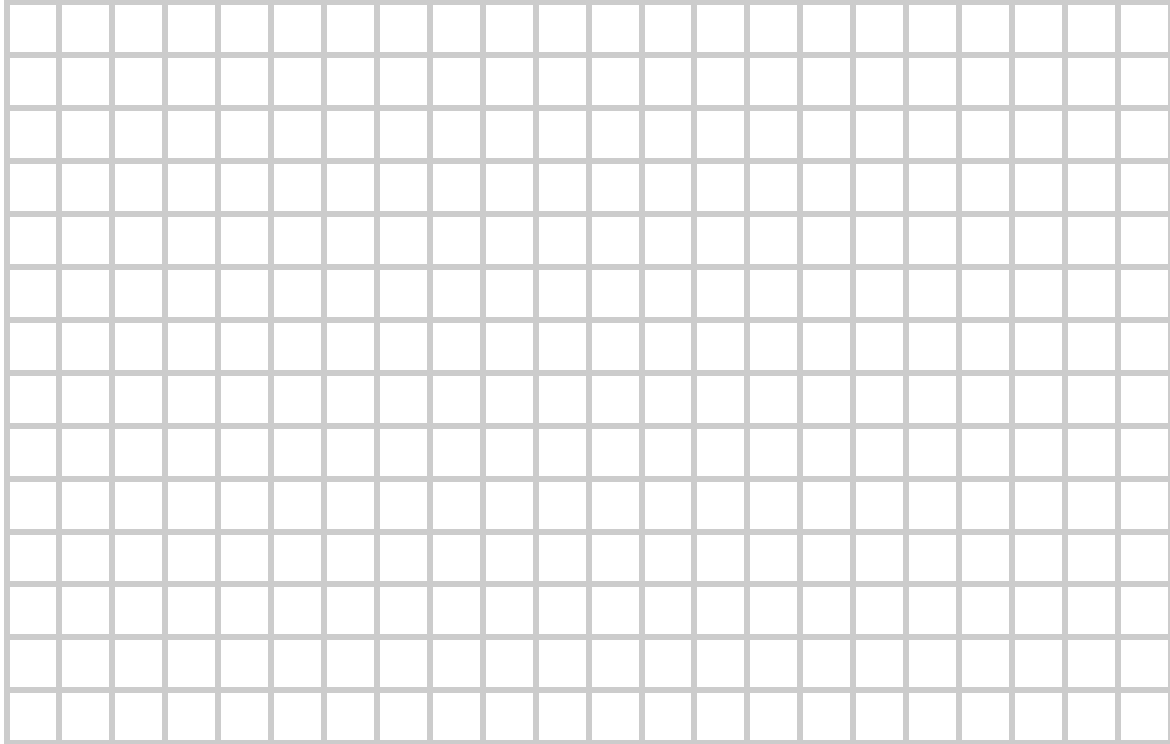


Name: _____

Each question is worth 5 points. Show your work in the space provided and **put a box around your final answer**. Answers should be simplified, but can include logarithmic and/or exponential expressions. Good luck!

1. Sketch the graph of $f(x) = 2 - \sqrt{x+1}$. Label any/all x -intercepts, y -intercepts, horizontal asymptotes, and vertical asymptotes. State the domain and range using interval notation.



2. Suppose $f(x) = 2x^2 + x$ and $g(x) = 3 - x$. Find $f(g(x))$ and $g(f(x))$.

3. Let f be the one-to-one function $f(x) = \frac{3}{x-4}$. Find $f^{-1}(x)$.

4. Use the following table to evaluate $g(f^{-1}(2))$.

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

5. Consider the quadratic function $q(x) = x^2 - 12x + 40$. Use “completing the square” to write $q(x)$ in standard form. Then determine the maximum/minimum value of $q(x)$ and state whether it is a maximum or a minimum.

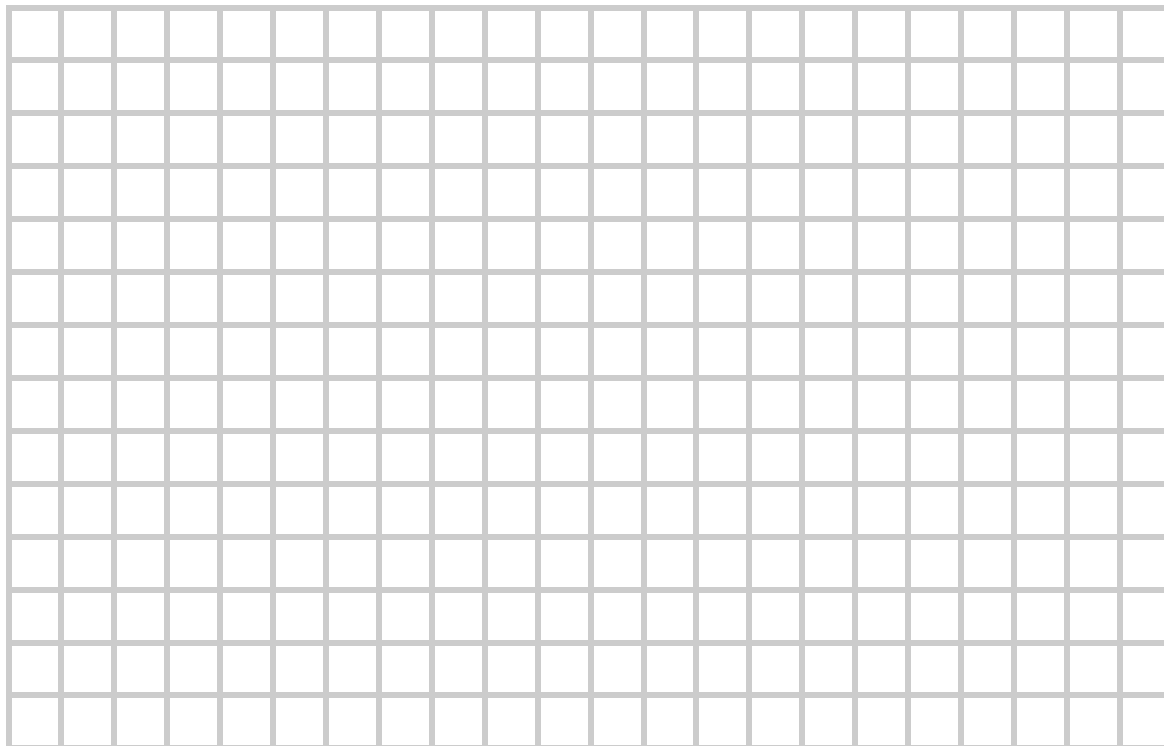
6. Find the maximum/minimum value of $f(x) = -\frac{x^2}{3} + 2x + 7$ and state whether it is a maximum or minimum.

7. Let $y = -7x^5 - x^4 + 5x + 2$. Describe the end behavior of f by filling in the blanks:

As $x \rightarrow -\infty$, $y \rightarrow$ _____.

As $x \rightarrow \infty$, $y \rightarrow$ _____.

8. Sketch the graph of the polynomial $P(x) = -\frac{2}{3}x^2(x - 4)$. Label any/all x -intercepts, y -intercepts, horizontal asymptotes, and vertical asymptotes. Make sure your graph exhibits the proper end behavior and correctly shows where $P(x)$ is positive/negative.

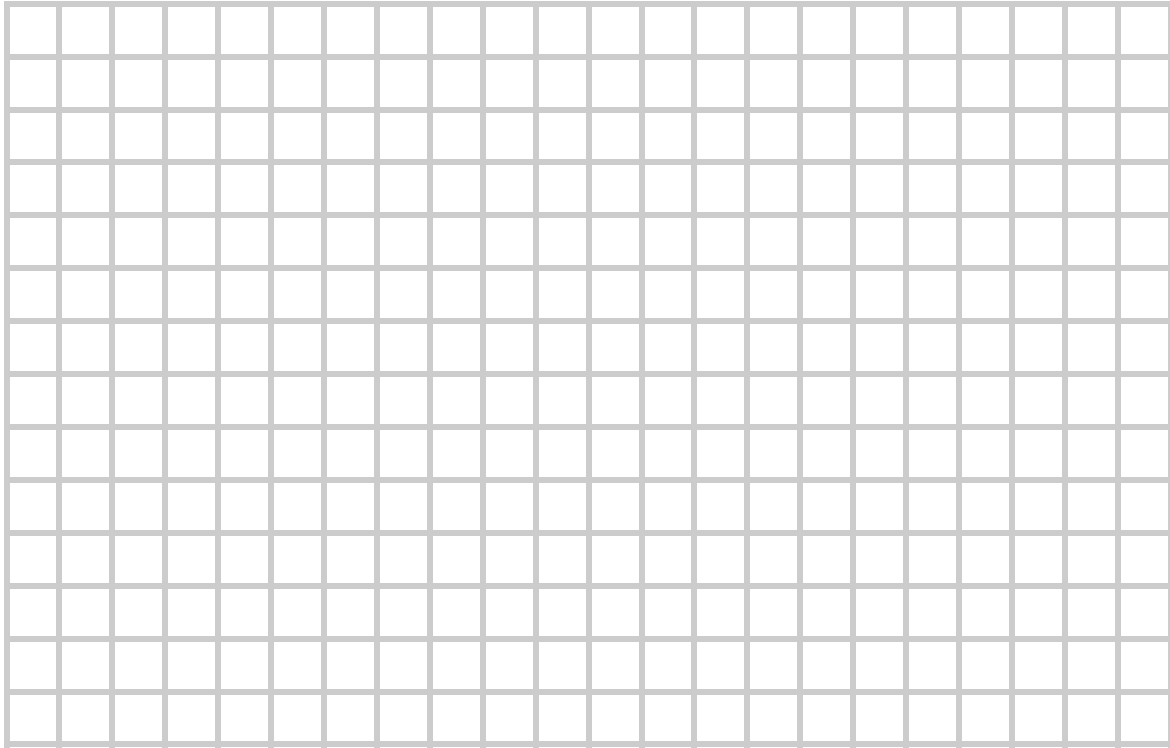


9. Solve: $7^{1-2x} = 7^{3x-5}$.

10. Solve $8e^{x/3} = 40$.

11. Solve: $\frac{50}{1 + e^{-x}} = 4$.

12. Sketch the graph of $f(x) = 2 + 4^{-x}$. Label any/all x -intercepts, y -intercepts, horizontal asymptotes, and vertical asymptotes. State the domain and range using interval notation.



13. Evaluate $\log_2\left(\frac{1}{32}\right)$.

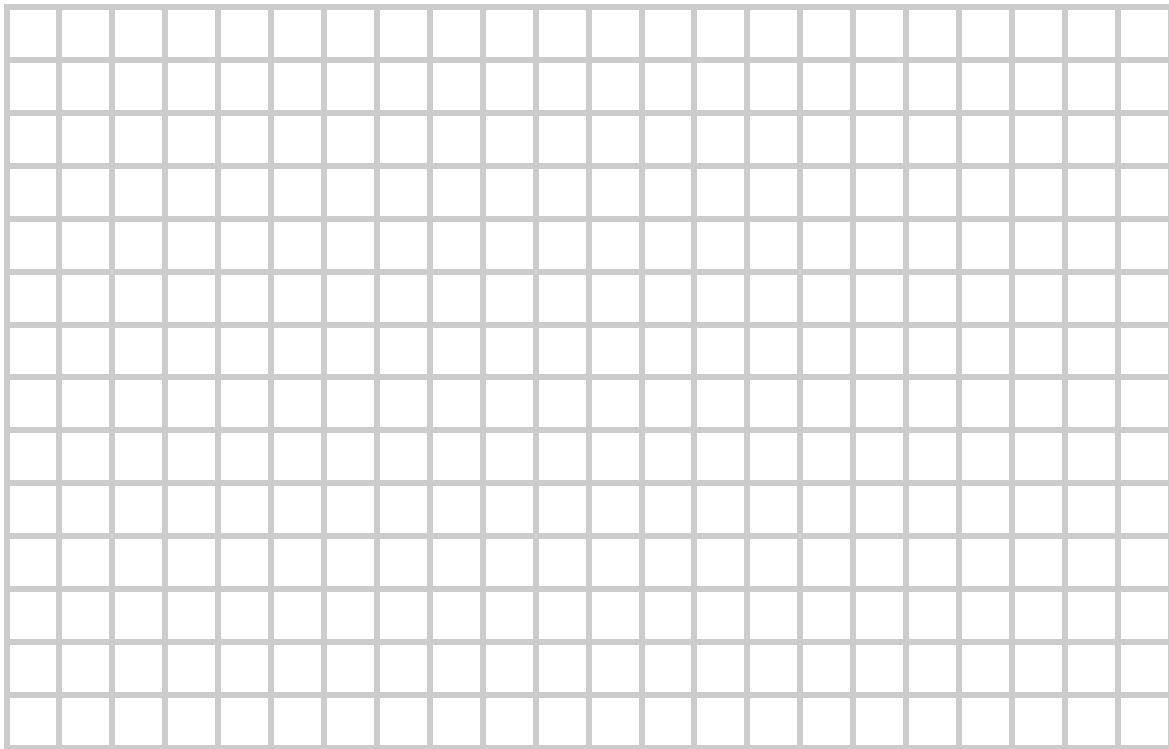
14. Use log laws to evaluate $3 \ln(2) + 2 \ln(3) - \ln(72)$.

15. Sketch the graphs of all three of the following functions on the same set of axes below. Label any/all x -intercepts, y -intercepts, horizontal asymptotes, and vertical asymptotes.

$$f(x) = x$$

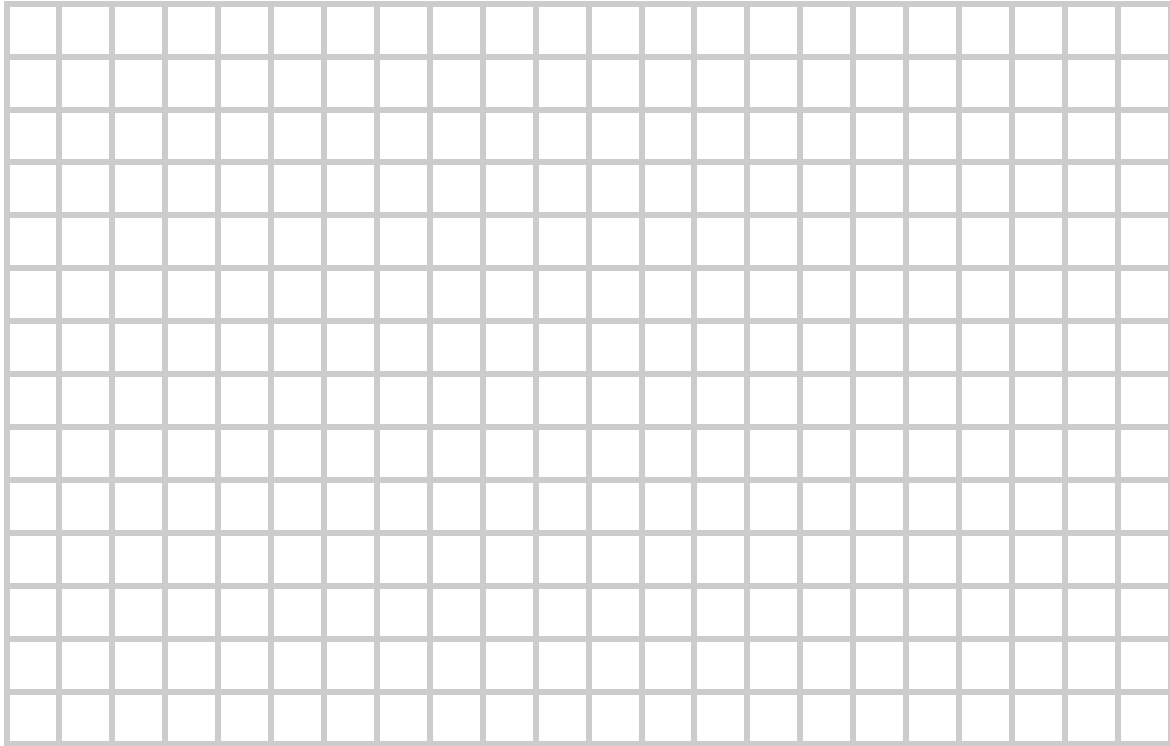
$$g(x) = e^x$$

$$h(x) = \ln(x)$$



16. Let $f(x) = \ln(1 - 6x)$. State the domain of f using interval notation.

17. Sketch the graph of $f(x) = -\log_5(x-3)$. Label any/all x -intercepts, y -intercepts, horizontal asymptotes, and vertical asymptotes. State the domain and range using interval notation.



18. Solve: $2 \ln(x) = \ln(2) + \ln(3x - 4)$.

19. Solve: $\log_5(x + 1) - \log_5(x - 1) = 2$.

20. Solve: $\log(x + 2) + \log(x - 1) = 1$.