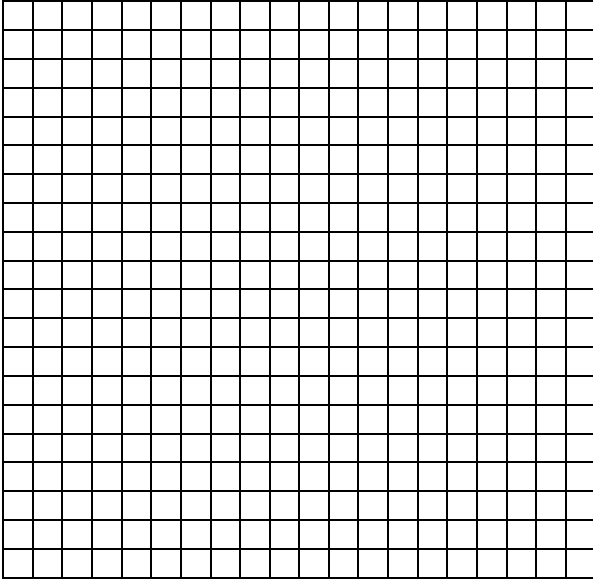


Show all necessary steps Clearly, Neatly, and Systematically to receive full credit. Any incorrect statement will be penalized.

1. Solve: $2x^{\frac{2}{5}} + 3x^{\frac{1}{5}} = -1$.

2. Write the logarithm as the sum and/or difference of logarithms: $\log_3 \sqrt[5]{\frac{x^3 y^2}{z^4}}$.

3. Let $f(x) = -2x^2 + 8x - 10$. **(i)** write $f(x) = a(x-h)^2 + k$, **(ii)** vertex, **(iii)** axis of symmetry, **(iv)** max or min function value, **(v)** x-intercept, **(vi)** y-intercept, **(vii)** sketch.



(i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____

(vi) _____

4. Write the logarithmic expression as one logarithm: $3\log_c(x+1) - 2\log_c(x+2) + \log_c x - \frac{1}{2}\log_c z$.

5. Let $f(x) = 2x + 1$ and $g(x) = x^2 - 1$.

a. Find $(f \circ g)(-2)$.

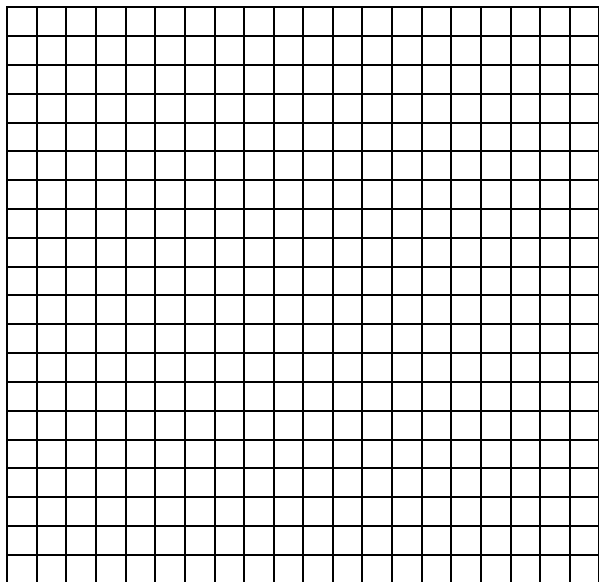
c. Find $(g \circ f)(x)$.

b. Find $(f - g)(x)$.

d. Find domain of $\left(\frac{f}{g}\right)(x)$.

6. Let $f(x) = \sqrt[3]{x+4} - 5$ Find the inverse function of $f(x)$.

7. Let $g(x) = 4^{x-1} + 2$. **(i)** Graph the function by transformation, **(ii)** Label asymptote, **(iii)** State domain and range.



8. Solve: $\log_2(x-7) + \log_2 x = 3$.

9. Solve: $\log(x-6) - \log(x-2) = \log\left(\frac{5}{x}\right)$.

10. If not checked, the population of a colony of bed bugs will grow exponentially at a rate of 65% per week. If a colony currently has 50 bedbugs, how many will there be in 6 weeks?