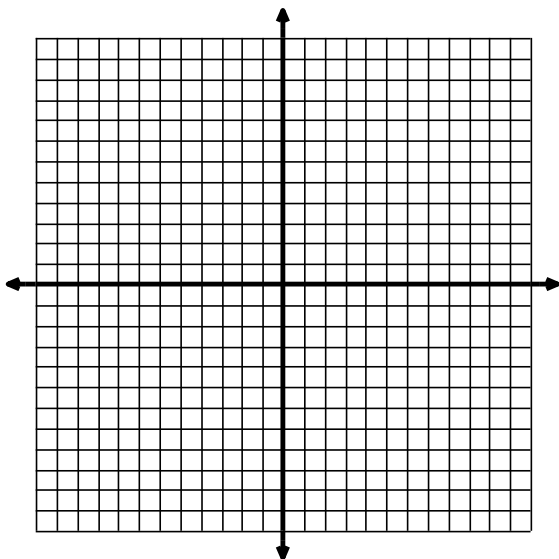


Show all work in the space provided. This will be worth 65 points towards your first quarter grade based on correctness. All algebraic work must be shown to receive full credit. No Calculators may be used. In addition to the 65 points, a test will be given on the 4<sup>th</sup> day of class. GOOD LUCK!!!

For #1-4 sketch the function and state its domain, range, and asymptotes (if they exist) (4 pts each).

1.  $y = 2(x - 2)^2 + 1$

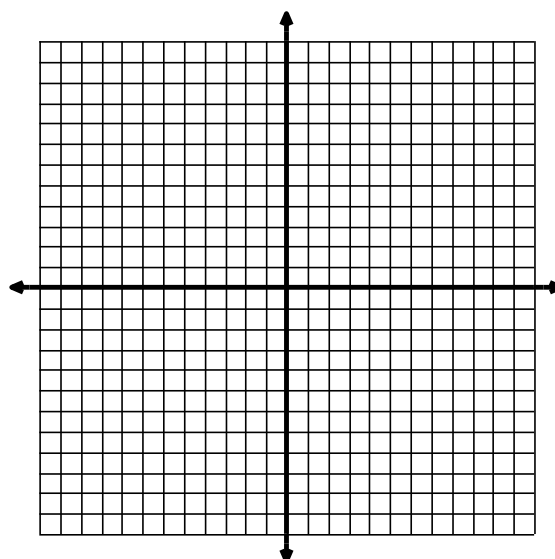


domain: \_\_\_\_\_

range: \_\_\_\_\_

asymptote: \_\_\_\_\_

2.  $y = |x^2 - 4|$

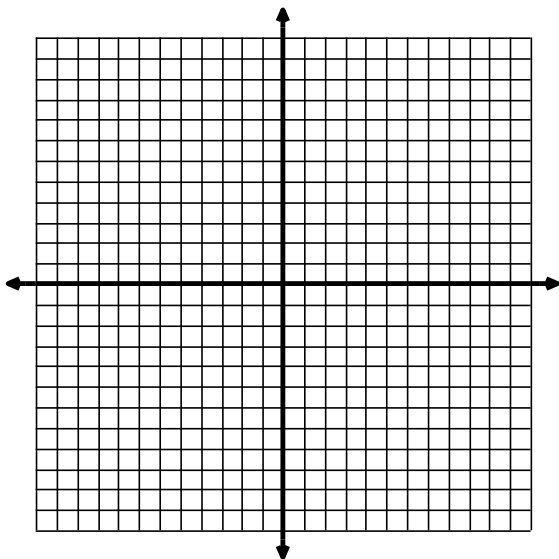


domain: \_\_\_\_\_

range: \_\_\_\_\_

asymptote: \_\_\_\_\_

3.  $y = \ln(5 - x) + 1$

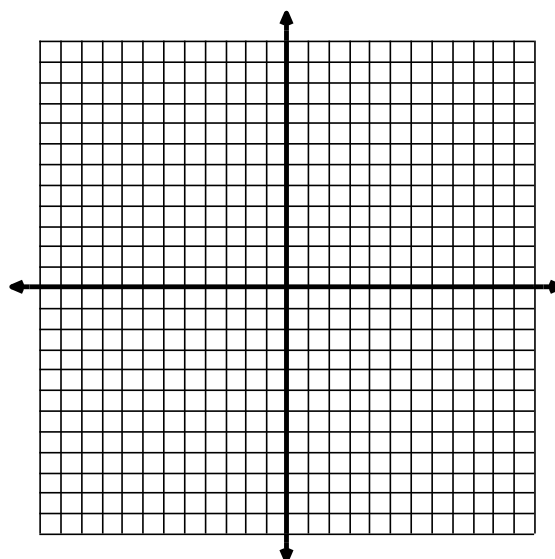


domain: \_\_\_\_\_

range: \_\_\_\_\_

asymptote: \_\_\_\_\_

4.  $y = \sec(2x)$



domain: \_\_\_\_\_

range: \_\_\_\_\_

asymptote: \_\_\_\_\_

For #5-7 state whether the function is even, odd, or neither and show algebraic support (3 pts each).

5.  $f(x) = x^3 + 4x^2 - 3$

6.  $f(x) = \frac{4}{x}$

7.  $f(x) = \cos(x) \sin(x)$

8. Let  $f(x) = \frac{-2}{3}x + 5$  and  $g(x) = \log 3x$  for  $x > 0$ . Let  $h(x)$  be the composition of  $f(x)$  and  $g(x)$ ; that is  $h(x) = f(g(x))$ , and let  $k(x)$  be the composition of  $g(x)$  and  $f(x)$ ; that is  $k(x) = g(f(x))$ .

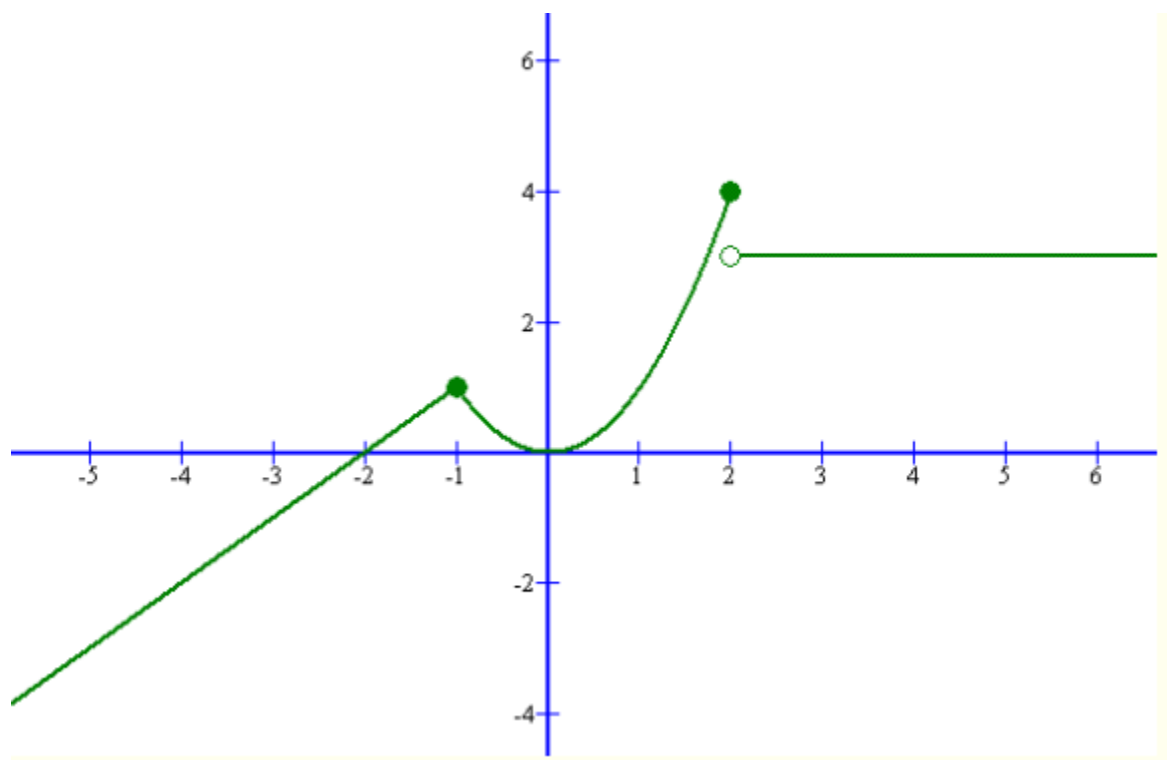
a) (2 pts) Find the domain and range of  $h(x)$ .

b) (2 pts) Find the domain and range of  $k(x)$ .

9. (3 pts) Find the inverse of the function:  $f(x) = \frac{x+1}{2x-3}$ ;  $x \neq \frac{3}{2}$ . Confirm algebraically that the function you found is the inverse of the given function.

10. Write an equation for the graph shown below (6 pts).

10. \_\_\_\_\_



11. (3 pts) Use properties of logarithms to expand the function  $f(x) = \ln \frac{x(x+5)^3}{\sqrt{x-1}}$  completely.

12. (4 pts) Calculate  $\log_{25} 30 + \log_{25} \frac{1}{6}$ . (To receive any credit, all work must be shown. You may not use a calculator!!)

13. (4 pts) Determine the period and amplitude of the function:  $y = \frac{1}{2} \sin\left(\frac{x}{3} - \frac{\pi}{2}\right)$ .

Period = \_\_\_\_\_

Amplitude = \_\_\_\_\_

For 14.-17. Solve the equation for  $x$ . If necessary, leave as a log or natural log.(4 pts each).

14.  $\cos(x) = \frac{\sqrt{3}}{2}$        $0 \leq x \leq 2\pi$

15.  $\sin(2x) = \frac{\sqrt{3}}{2}$        $-\infty < x < \infty$

16.  $e^{7x} = 5$

17.  $2\sin^2(x) + \sin(x) = 1$ ;  $0 \leq x \leq 2\pi$