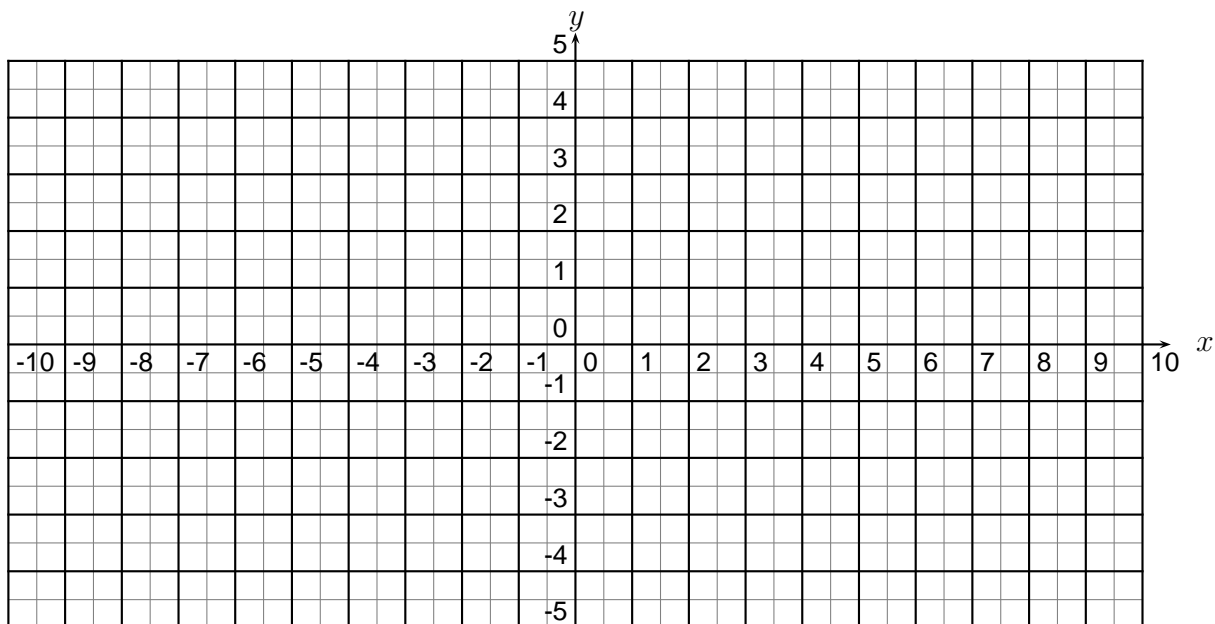




1. Let  $f(x) = -\ln(x - 2)$ .

- (a) [15 points] Graph  $f(x)$  on the axes provided below. On the graph, clearly label any asymptotes and  $x$ -intercepts (if there are any).



- (b) [8 points] Find the domain of  $f(x)$ .

- (c) [8 points] Find the range of  $f(x)$ .

2. [15 points] Solve the following equation for  $x$ :

$$3^{7x-5} = 7^{2x-3}$$

3. [15 points] Solve the following equation for  $x$ :

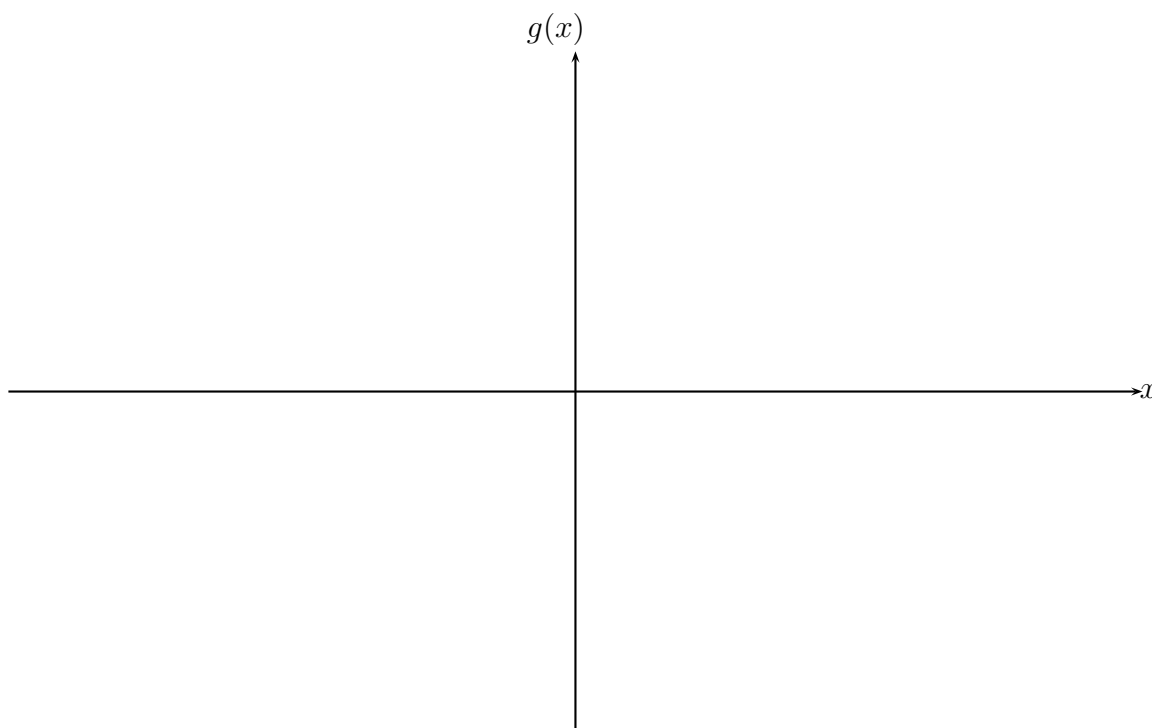
$$\ln(x) + \ln(x + 3) = \ln(10)$$

4. Let  $g(x) = \frac{x^3}{x^2 - 4}$ .

(a) [5 points] Find all  $x$ -intercepts of  $g(x)$ .

(b) [14 points] Find the equations of all asymptotes of the graph of  $g(x)$ .

(c) [14 points] Graph the function  $g(x)$  on the axes below. Be sure to label the axes, any asymptotes, and any  $x$ -intercepts on your graph.



5. [16 points] Stony Brook is repainting the center line, the center circle, and the perimeter of the basketball court. The athletic director purchased enough paint to paint 800 feet in total. The center circle has a radius of 6 feet. Express the area  $A$  of the basketball court as a function of  $x$ , the length of the center line of the court.

