

Show all your work for full credit. Each question worth 8 points unless otherwise specified.

- 1) Find the domain. Give your answer in interval notation.

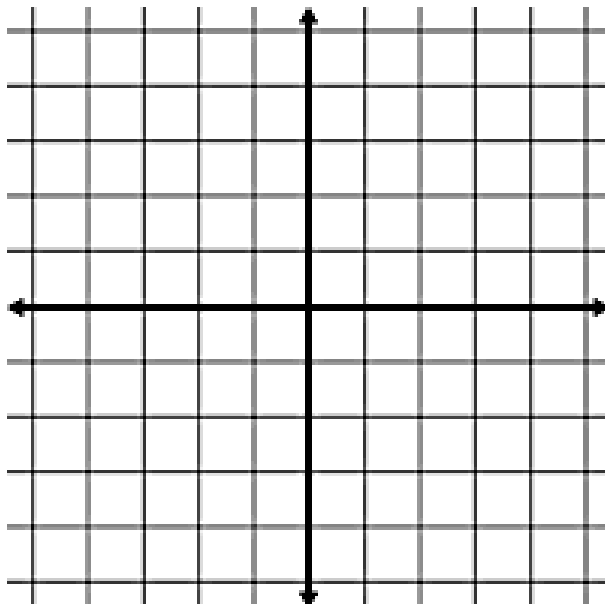
$$f(x) = \sqrt{4 - x^2}$$

- 2) Rewrite the quadratic function in standard form. What is the vertex?

$$f(x) = x^2 + 6x - 3$$

- 3) Graph

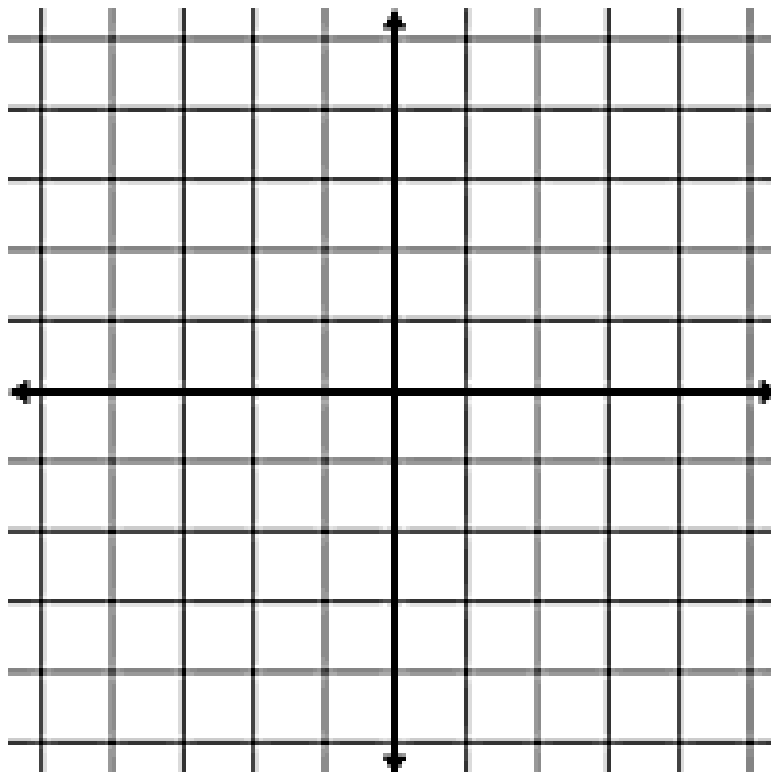
$$f(x) = \begin{cases} -x^2 + 4 & \text{if } x < -1 \\ 5 & \text{if } x = -1 \\ 2x - 1 & \text{if } x > -1 \end{cases}$$



4) Let

$$f(x) = \frac{x - 2}{x^2 - 3x - 4}$$

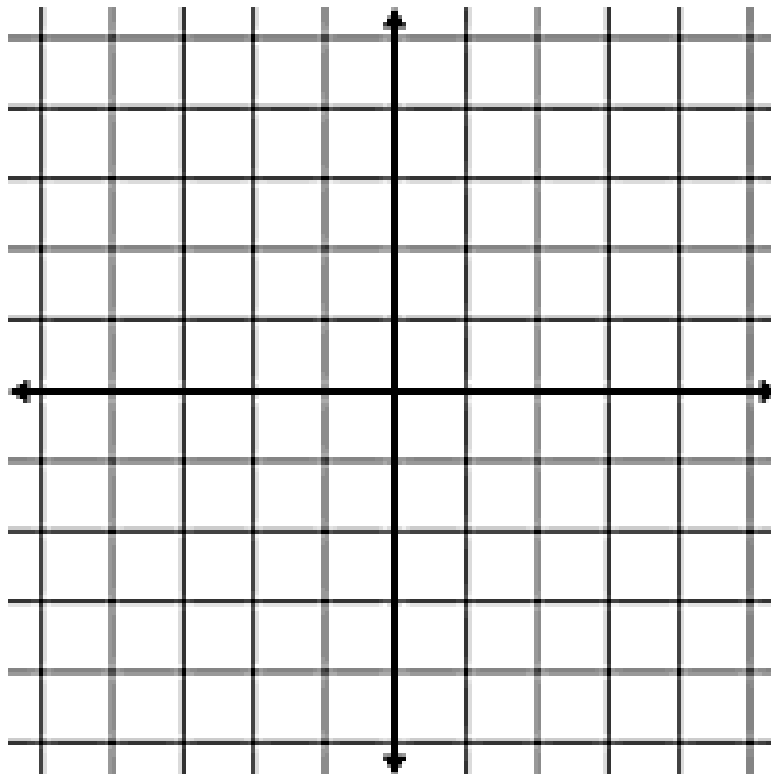
- a) List any vertical asymptotes (if any). (2 points)
- b) List any horizontal or oblique asymptotes (if any). (2 points)
- c) What is the y-intercept (if any)? (1 point)
- d) What are the x-intercepts (if any)? (2 points)
- e) What is the domain of f ? (2 points)
- f) Graph $f(x)$. Be sure to label any asymptotes and x- and y-intercepts. Use appropriate scale to show all important features. (3 points)



5) Let

$$f(x) = \frac{x^2 - 16}{x - 2}$$

- a) List any vertical asymptotes (if any). (2 points)
- b) List any horizontal or oblique asymptotes (if any). (2 points)
- c) What is the y-intercept (if any)? (1 point)
- d) What are the x-intercepts (if any)? (2 points)
- e) What is the domain of f ? (2 points)
- g) Graph $f(x)$. Be sure to label any asymptotes and x- and y-intercepts. Use appropriate scale to show all important features. (3 points)



Solve for x . Exact answers only unless specified. That means no decimal approximations (e.g. $\ln 2$ is correct, not .693)

6) $2^{6x+1} = 8^x$

7) $\log(3x) - \log(x + 2) = 1$

8) $\log_2(x - 2) + \log_2 x = 3$

9) $e^{2x} - 40 = 3 \cdot e^x$

10) Suppose \$1000 is invested at an interest rate k , compounded continuously, and grows to \$1316.53 in 5 years.

a) Find the interest rate to the nearest tenth of a percent. (4 points)

b) Find the exponential growth function. (2 points)

c) Find the balance after 12 years. (2 points)

11) Find the inverse of the function $f(x) = 5^{x+2} - 7$.