Honors Math II
Final review #25

Name Key
Period_____ Date_____

Graph the function. Show the asymptotes and the intercepts.

1. $f(x) = \frac{1}{x^2 - 25}$

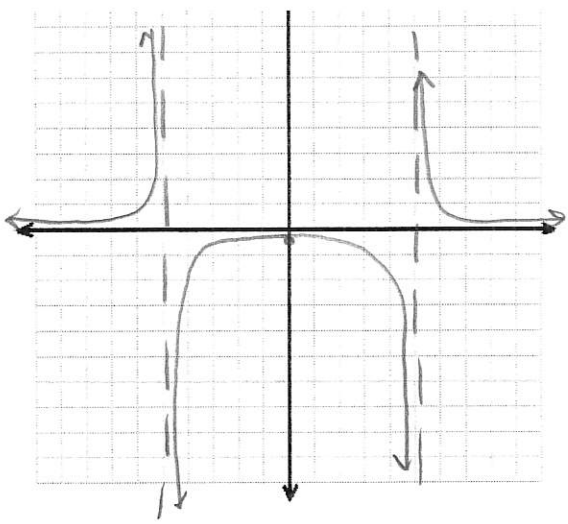
$(x+5)(x-5)$

x-intercept:

y-intercept: $(0, -1/25)$

Vertical asymptotes: $x = 5$ $x = -5$

Horizontal Asymptotes: $y = 0$



2. $f(x) = \frac{x+1}{x^2 - 2x+1}$

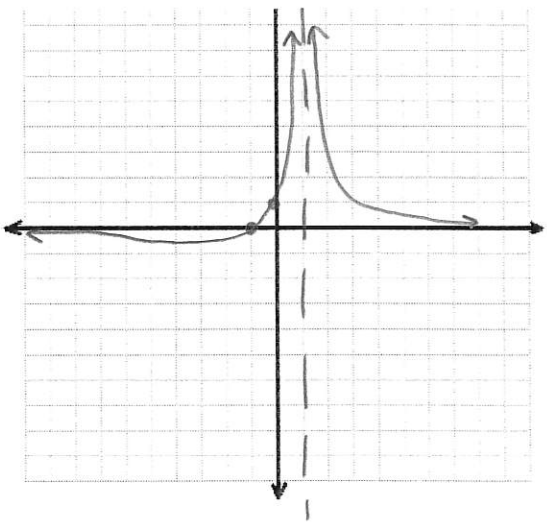
$(x-1)(x-1)$

x-intercept: $(-1, 0)$

y-intercept: $(0, 1)$

Vertical asymptotes: $x = 1$

Horizontal Asymptotes: $y = 0$



Find the zeros and vertical asymptotes.

3. $f(x) = \frac{6x^2 - x - 2}{x^2 - 4}$

$(3x-2)(2x+1)$

$(x+2)(x-2)$

Zeros: $x = 2/3$, $x = -1/2$

VA: $x = 2$, $x = -2$

4. $f(x) = \frac{3x - 7}{x^2 - 2x - 15}$

$(x-5)(x+3)$

Zeros: $x = 7/3$

VA: $x = 5$, $x = -3$

5. If $g(x) = 4x + 10$, what is $g^{-1}(x)$?

$y = 4x + 10$

$x = 4y + 10$

$x - 10 = 4y$

$y = \frac{x-10}{4}$

$g^{-1}(x) = \frac{1}{4}x - \frac{10}{4}$

6. If $f(x) = x^2 + 3$, what is $f^{-1}(x)$?

$y = x^2 + 3$

$x = y^2 + 3$

$x - 3 = y^2$

$y = \pm\sqrt{x-3}$

$f^{-1}(x) = \pm\sqrt{x-3}$

Given: $h(x) = 2x + 5$ **and** $g(x) = 4x - 9$

Find:

$h(x) \cdot g(x)$

7. $(h \cdot g)x =$

$(2x+5)(4x-9)$

$8x^2 - 18x + 20x - 45$

$8x^2 + 2x - 45$

$h(x) - g(x)$

8. $(h - g)x =$

$(2x+5) - (4x-9)$

$2x + 5 - 4x + 9$

$-2x + 14$

$h(3) + g(3)$

9. $(h + g)(3) =$

$11 + 3 =$

14

Solve the following system.

10. $y = x^2 + 6x + 5$

$y = -2x^2 - 12x - 10$

$x^2 + 6x + 5 = -2x^2 - 12x - 10$

$3x^2 + 18x + 15 = 0$

$3(x^2 + 6x + 5) = 0$

$3(x+5)(x+1) = 0$

$x = -5 \quad x = -1$

substitute to find y

$\boxed{(-5, 0) \quad (-1, 0)}$

11. $y - 10x = 5$ $\quad y = 10x + 5$

$y = x^2 + 7x + 5$

$10x + 5 = x^2 + 7x + 5$

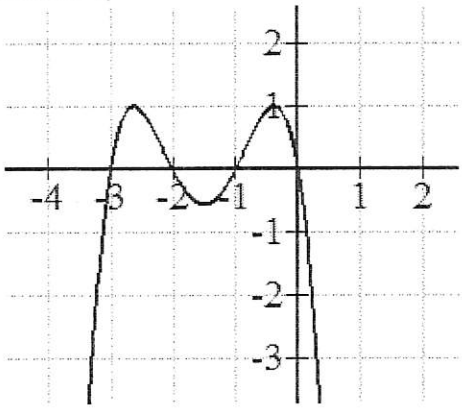
$x^2 - 3x = 0$

$x(x-3) = 0$

$x = 0 \quad x = 3$

$\boxed{(0, 5) \quad (3, 35)}$

12.



Leading coefficient: positive or negative

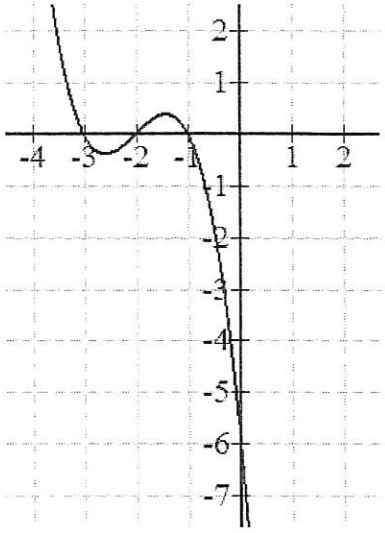
Degree: odd or even

Describe the end behavior:

$x \to -\infty \quad f(x) \to -\infty$

$x \to \infty \quad f(x) \to -\infty$

13.



Leading coefficient: positive or negative

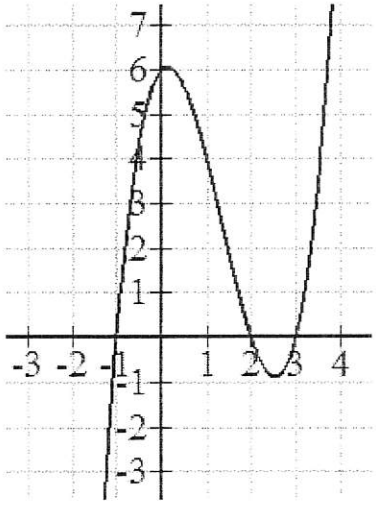
Degree: odd or even

Describe the end behavior:

$x \to -\infty \quad f(x) \to \infty$

$x \to \infty \quad f(x) \to -\infty$

14.



Leading coefficient: positive or negative

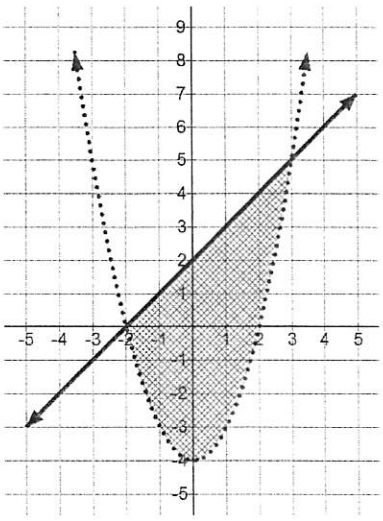
Degree: odd or even

Describe the end behavior:

$x \to -\infty \quad f(x) \to -\infty$

$x \to \infty \quad f(x) \to \infty$

15. Write the inequalities for the given system.



$y \le x + 2$

$y > x^2 - 4$

16. Write the polynomial with the given zeros.

$1 + \sqrt{5}, 1 - \sqrt{5}$

$(x - 1 - \sqrt{5})(x - 1 + \sqrt{5})$

$x^2 - x + \sqrt{5}x$

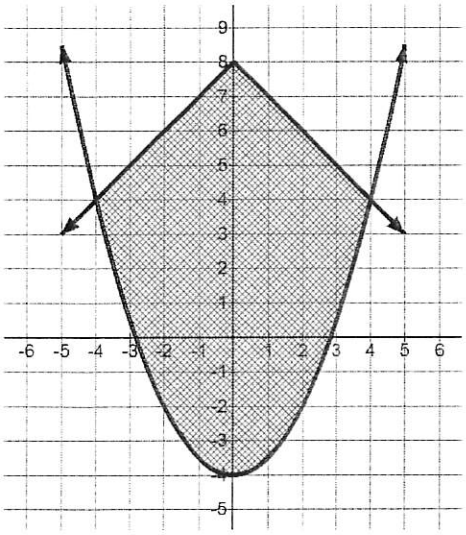
$-x \quad +1 - \sqrt{5}$

$-\sqrt{5}x - 5 + \sqrt{5}$

$x^2 - 2x - 4$

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

17. Choose the correct system of equations for the given graph.



~~a)~~ $y \le -|x| + 8$

~~$y \le \frac{1}{2}x^2 - 4$~~

~~b)~~ ~~$y \ge -|x| + 8$~~

$y \ge \frac{1}{2}x^2 - 4$

c) $y \le -|x| + 8$

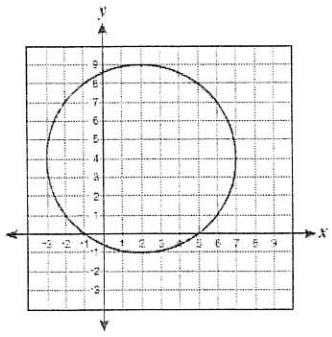
$y \ge \frac{1}{2}x^2 - 4$

~~d)~~ ~~$y \ge -|x| + 8$~~

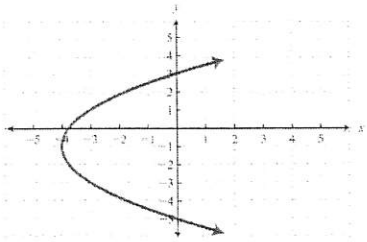
$y \le \frac{1}{2}x^2 - 4$

18. Which of the following relations is a function?

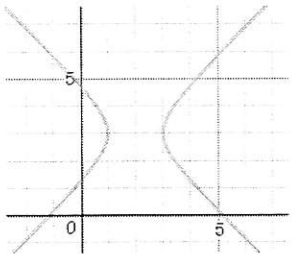
a)



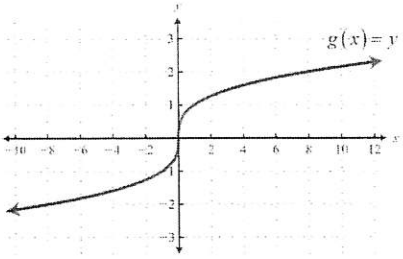
b)



c)



d)



19. Which of the following relations is a function?

a) $(x-3)^2 + (y+2)^2 = 9$

b) $x^2 - y^2 = 1$

c) $y = (x-4)^2 + 7$

d) $x = (y+1)^2 - 5$

State the domain and range of the following functions.

20. $y = -\frac{2}{3}|x-3| + 5$

D: $\mathbb{R}$ or $\mathbb{R}$

R: $(-\infty, 5]$ $y \leq 5$

21. $y = \sqrt{x+2} + 4$

D: $[-2, \infty)$ $x \geq -2$ or

R: $[4, \infty)$ $y \geq 4$

22. $y = 5\sqrt[3]{x} - 10$

D: $\mathbb{R}$

R: $\mathbb{R}$

23. $y = -3(x-6)^2 - 7$

D: $\mathbb{R}$ or $\mathbb{R}$

R: $(-\infty, -7]$ $y \leq -7$