HAPC
Unit 1
1.8 Rational Functions and Zeros

Name: _____

Hour: _____ Date: _____

Directions: Find the zeros and domain for the following rational functions.

1. $y = \dfrac{(x+3)(x-2)}{(x-1)(x+5)}$

Zeros: $(-3,0), (2,0)$

Domain: $\mathbb{R}\ x \neq 1, -5$

2. $y = \dfrac{x^2}{(x-1)(x+2)}$

Zeros: $(0,0)$

Domain: $\mathbb{R}\ x \neq -2, 1$

3. $y = \dfrac{(x-3)(x-6)}{(x-6)(x-2)}$

Zeros: $(3,0)$ ~~$(6,0)$~~

Domain: $\mathbb{R}\ x \neq 6, 2$

4. $h(x) = \dfrac{x^2-x-20}{x^2+x-20}$

Zeros: $(5,0)(-4,0)$

Domain: $\mathbb{R}\ x \neq -5, 4$

5. $f(x) = \dfrac{x^2-9}{x^2-2x-15}$

Zeros: $(3,0)$

Domain: $\mathbb{R}\ x \neq 5, -3$

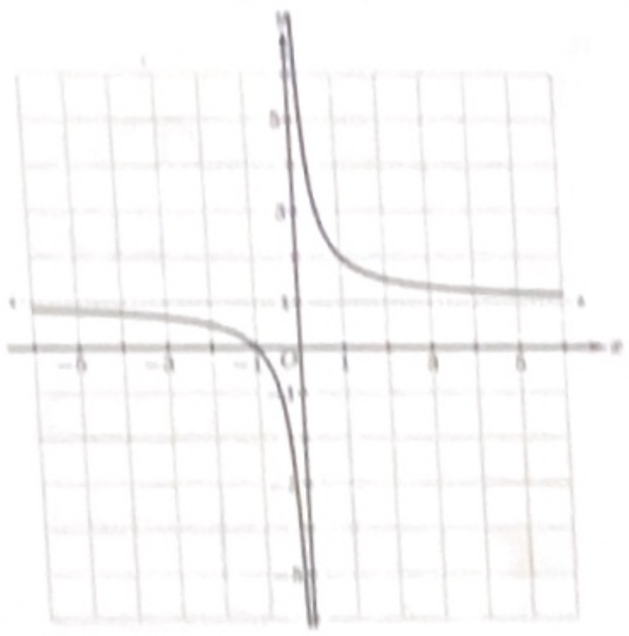
6. $g(x) = \dfrac{x^3-4x^2-32x}{2x^2+7x-4}$

Numerator 0 are $0, 8, -4$

Zeros: $(0,0)$ $(0,-8)$

Domain: $\mathbb{R}\ x \neq \frac{1}{2}, -4$

Directions: The graphs of several rational functions are given below. Use the graphs to solve the following inequalities.



Graph of f

7. $f(x) > 0$

$(-\infty, 1) \cup (0, \infty)$

Graph of g

8. $g(x) \leq 0$

$(-1, 1]$

Graph of h

9. $h(x) \geq 0$

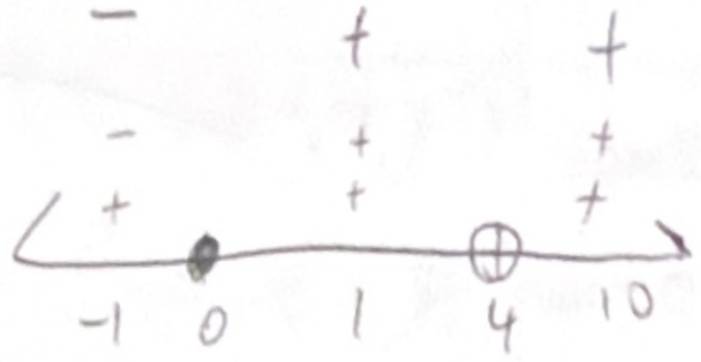
$(-\infty, -2] \cup (-1, 0] \cup (1, \infty)$

Directions: Solve the following inequalities. Show a sign chart & write your answers using i
notation.

10. $\frac{x}{(x-4)^2}<0$

0
4

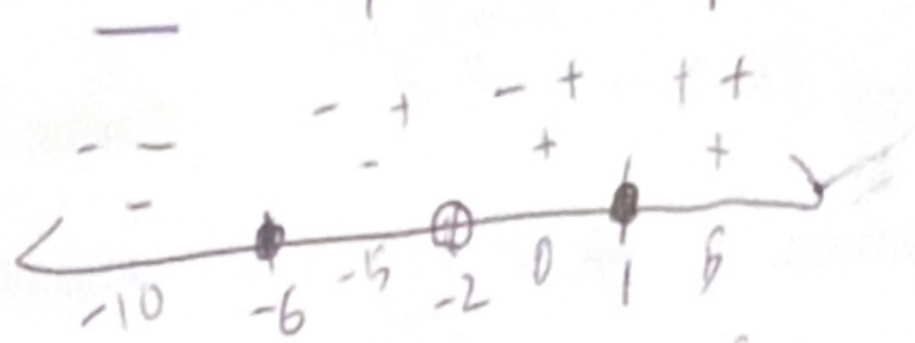
$(-\infty, 0)$



11. $\frac{(x-1)(x+6)}{x+2}\leq 0$

1 -6
-2

$(-\infty, -6] \cup (-2, 1]$

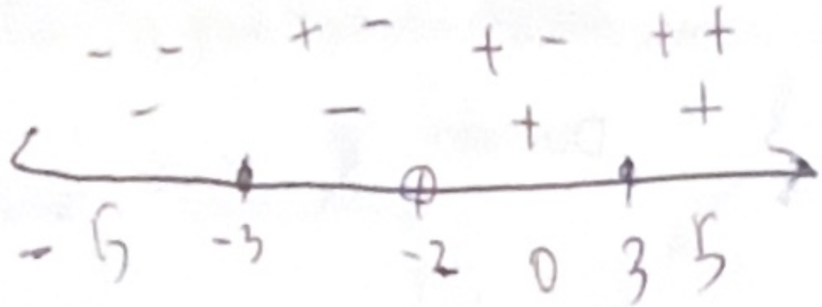


12. $\frac{x^2-9}{x+2}>0$

$\frac{(x+3)(x-3)}{x+2}$

-3 +3
-2

$(-3, -2) \cup (3, \infty)$

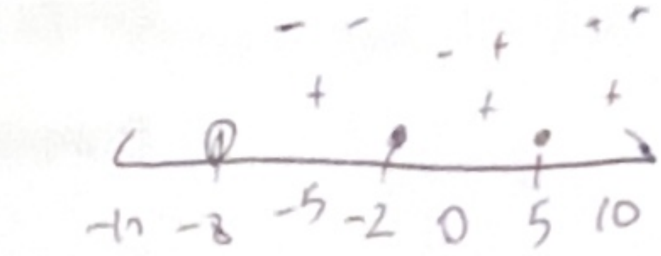


13. $\frac{x^2-3x-10}{x+8}<0$

$\frac{(x-5)(x+2)}{(x+8)}$

5 -2
-8

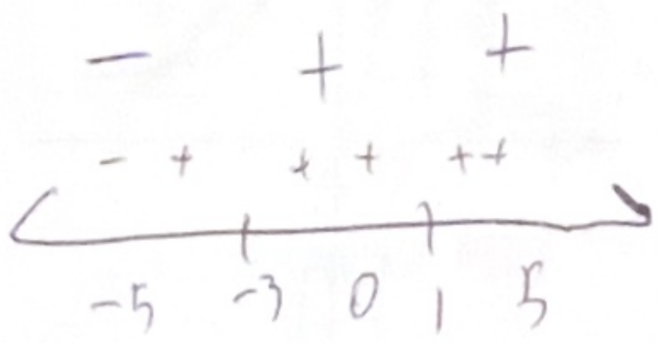
$(-\infty, -8) \cup (-2, 5)$



14. $(x+3)|x-1| \geq 0$

-3 1

$[-3, \infty)$



15. $\frac{(x-5)|x-2|}{\sqrt{2x-3}} \geq 0$

5 2
$\frac{3}{2}$

$[5, \infty)$