

Rational Inequalities (1.8) HW

Match each numbered equation to the letter of the corresponding graph. Use your understanding of analyzing the multiplicities of the zeros of the numerator and denominator of rational functions to aid in this task.

1. $y = \frac{x-4}{(x-1)^2}$

2. $y = \frac{(x+2)^2(x-1)^2}{(x+3)(x-1)(x-3)^2}$

3. $y = \frac{(x+2)(x-4)}{(x+3)^3(x-1)(x-3)}$

4. $y = \frac{(x+2)^2}{(x+3)^2(x-1)(x-3)^2}$

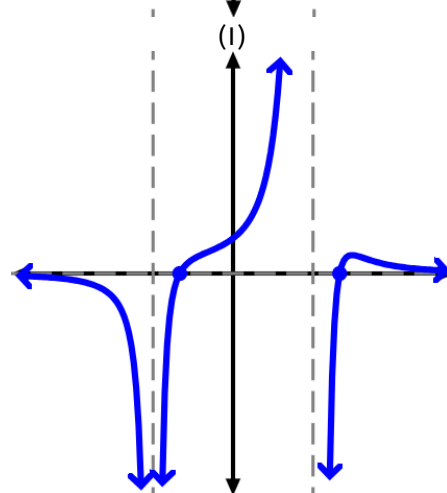
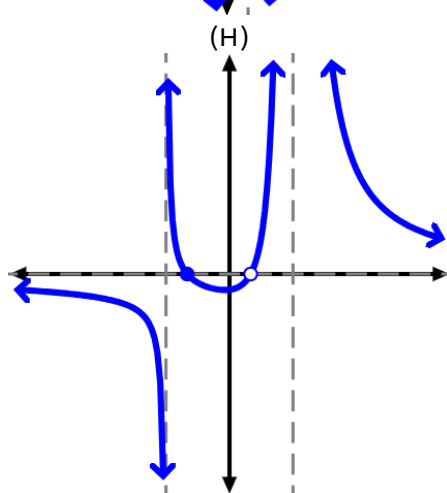
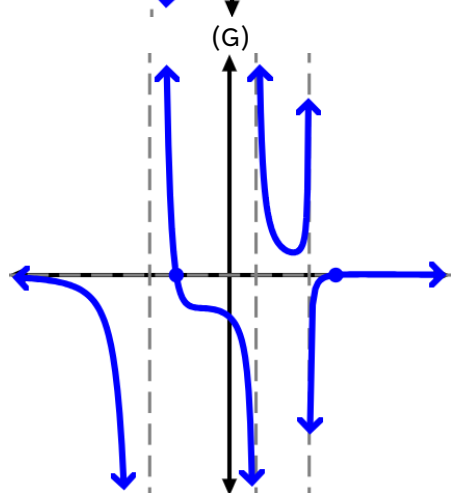
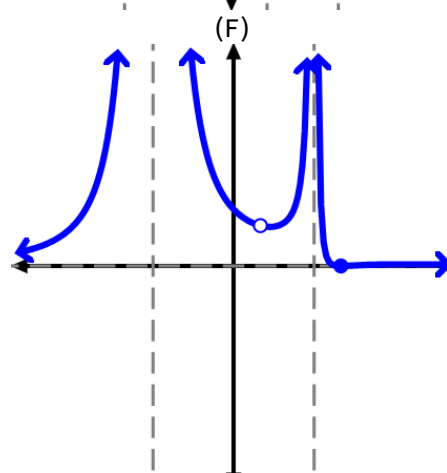
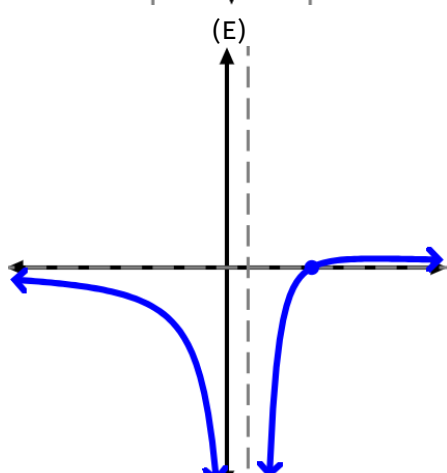
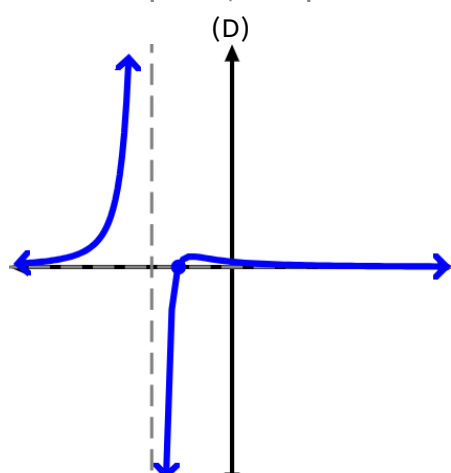
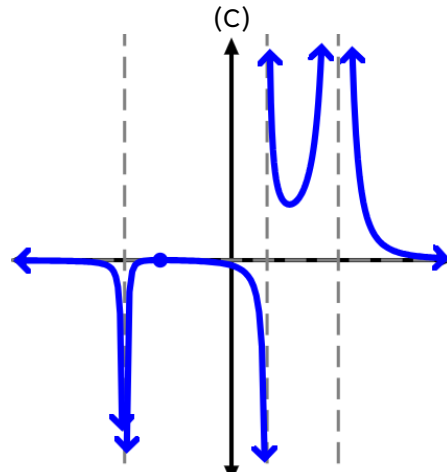
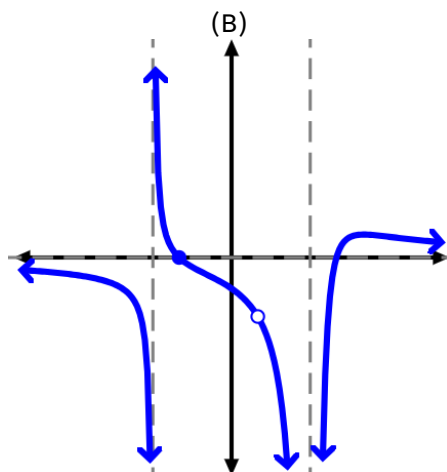
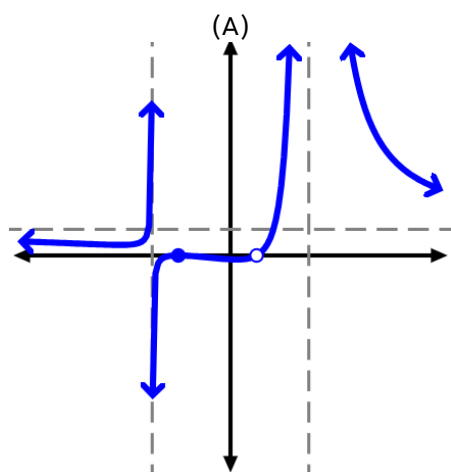
5. $y = \frac{(x+2)(x-4)}{(x+3)^2(x-3)^3}$

6. $y = \frac{(x+2)(x-1)^2}{(x+3)(x-1)(x-3)^2}$

7. $y = \frac{x+2}{(x+3)^3}$

8. $y = \frac{(x+2)(x-1)(x-4)}{(x+3)(x-1)(x-3)^2}$

9. $y = \frac{(x-1)^2(x-4)^2}{(x+3)^2(x-1)^2(x-3)^2}$



Solve each of the following inequalities. Express the solution in interval notation.

10. $\frac{x^2+x-12}{x^2-4x+3} \geq 0$

11. $\frac{x+6}{(x+2)^2} < 0$

12. $\frac{x^2+2x-3}{x^2-2x+1} \leq 0$

13. $\frac{(x+6)(x-1)^3(x+3)^2}{(x-4)(x+2)^4(x-1)} > 0$

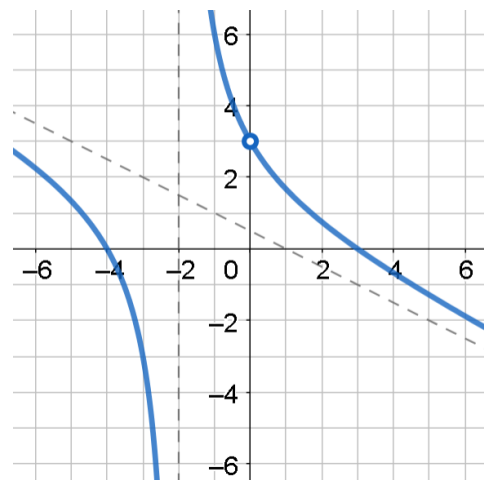
14. $\frac{(2-x)(x^2-4)^2}{(5-x)^3(x+2)} \leq 0$

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

16. $\frac{x^2+4x+5}{x^2+4x-5} < 0$

17. $\frac{4x^2-17x-15}{(2x-1)(2x^2+5x-3)} \geq 0$

18. To the right is a graph of $g(x)$, a rational function with vertical asymptote $x = -2$, slant asymptote $y = -\frac{1}{2}x + \frac{1}{2}$, a hole at $(0,3)$, and zero $x = 3$. On what interval is $g(x) \geq 0$?



Rational Inequalities (1.8) HW Answers

1. E
2. A
3. G
4. C
5. I
6. H
7. D
8. B
9. F
10. $(-\infty, -4] \cup (1, 3) \cup (3, \infty)$
11. $(-\infty, -6)$
12. $[-3, 1)$
13. $(-\infty, -6) \cup (4, \infty)$
14. $(-\infty, -2) \cup [2, 5)$
15. $(-\infty, -\sqrt{10}) \cup (\sqrt{10}, 4) \cup (4, \infty)$
16. $(-5, 1)$
17. $\left(-3, -\frac{3}{4}\right] \cup [5, \infty)$
18. $(-\infty, -4] \cup (-2, 0) \cup (0, 3]$