

Intermediate Algebra Skill

Solving Rational Inequalities: Polynomial Numerator and Denominator; RHS 0

Solve the following Rational Inequalities:

$$1) \frac{2x^3 + 4x}{x^2 + 5x + 6} < 0$$

$$2) \frac{x^2 - 6x + 9}{3x + 6x^3} \leq 0$$

$$3) \frac{2y^2 + 3y - 20}{y^3 - y^2} > 0$$

$$4) \frac{3y^2 - 9y^3}{12y^2 + 5y - 2} \geq 0$$

$$5) \frac{24y^3 - 6y^5}{20y^2 - 7y - 6} \leq 0$$

$$6) \frac{10y^2 - 13y - 30}{2y^5 - 50y^3} < 0$$

$$7) \frac{n^3 - 2n^2 - n + 2}{n^3 + 3n^2 + 4n + 12} < 0$$

$$8) \frac{n^3 + 3n^2 - 4n - 12}{n^3 - 5n^2 + 4n - 20} \leq 0$$

$$9) \frac{2n^3 + 5n^2 - 18n - 45}{3n^3 - n^2 + 27n - 9} \geq 0$$

$$10) \frac{12n^3 + 16n^2 - 3n - 4}{8n^3 + 12n^2 + 10n + 15} > 0$$

Answers to Solving Rational Inequalities: Polynomial Numerator and Denominator; RHS 0

1) $(-\infty, -3) \cup (-2, 0)$

2) $(-\infty, 0) \cup \{3\}$

3) $(-4, 0) \cup (0, 1) \cup \left(\frac{5}{2}, \infty\right)$

4) $\left(-\infty, -\frac{2}{3}\right) \cup \left[\frac{1}{4}, \frac{1}{3}\right] \cup \{0\}$

5) $\left[-2, -\frac{2}{5}\right) \cup \left[0, \frac{3}{4}\right) \cup [2, \infty)$

6) $(-\infty, -5) \cup \left(-\frac{6}{5}, 0\right) \cup \left(\frac{5}{2}, 5\right)$

7) $(-3, -1) \cup (1, 2)$

8) $[-3, -2] \cup [2, 5)$

9) $(-\infty, -3] \cup \left[-\frac{5}{2}, \frac{1}{3}\right) \cup [3, \infty)$

10) $\left(-\infty, -\frac{3}{2}\right) \cup \left(-\frac{4}{3}, -\frac{1}{2}\right) \cup \left(\frac{1}{2}, \infty\right)$