SOLVE FRACTIONAL INEQUALITIES WITH NEGATIVES

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1. $1/x < 2$
2. $-1/x > 3$
3. $2/(x-1) \leq -1$
4. $-3/(x+2) > 2$
5. $1/(2x) \geq -4$
6. $-2/(3x) < 1$
7. $(x+1)/(x-2) > 0$
8. $(x-3)/(x+1) \leq 0$
9. $(-x+2)/(x-4) \geq 0$
10. $(-2x+1)/(x+3) < 0$
11. $3/(x-1) + 1/(x+2) > 0$
12. $2/(x+1) - 1/(x-3) \leq 0$
13. $(x^2-4)/(x+3) > 0$
14. $(x^2-9)/(x-1) \leq 0$
15. $(-x^2+1)/(x+2) \geq 0$
16. $(2x-1)/(x^2-4) < 0$
17. $(x+3)/(x^2-1) \geq 0$
18. $(-x-2)/(x^2-9) > 0$
19. $1/(x-2) + 2/(x+1) < 1$
20. $3/(x+2) - 1/(x-1) \geq 2$
21. $(2x+1)/(x-3) - (x-2)/(x+1) > 0$
22. $(x+4)/(x-2) + (x-1)/(x+3) \leq 1$
23. $|1/x| > 2$
24. $|(x-1)/(x+2)| \leq 3$
25. $|2/(x-3)| < 1$
26. $|(-x+2)/(x+1)| \geq 2$
27. $(x^2-1)/(x+2)^2 > 0$
28. $(x-3)^2/(x+1) \leq 0$

29. $(-x^2+4)/(x-1)^2 \geq 0$

30. $(2x+1)^2/(x^2-4) < 0$

MASTER QUESTIONS

M1. A chemical reaction rate R is given by R = k/(T+273) where k is a constant and T is temperature in °C. For the reaction to proceed at a rate greater than 0.01k, find the temperature range.

M2. The efficiency E of a machine is modelled by E = (100-P)/(P+20) where P is power input in watts. Find when efficiency exceeds 50%.

M3. A car's fuel consumption C in litres per 100km is given by C = 8 + 12/(v-40) where v is speed in km/h. Determine speeds where consumption is less than 10 litres/100km.

M4. The profit P in thousands of pounds for a company is P = (x-50)/(x+10) where x is units sold in hundreds. Find when profit is negative.

M5. A spring's extension e in cm under load L kg is e = 5L/(L-2). Find loads where extension exceeds 10cm.

M6. The concentration C of a drug in mg/litre over time t hours is C = 20t/(t^2-4). Determine when concentration is below 2mg/litre.

M7. A population growth rate r is given by r = (N-1000)/(N+500) where N is population size. Find when growth rate is positive.

M8. The pressure P in kPa in a container is P = 150/(T-293) where T is temperature in Kelvin. Find temperatures where pressure is less than -30kPa.

M9. A beam's deflection d in mm under load w kg is d = (w^2-16)/(w-4). Find loads where deflection is positive.

M10. The cost per unit C in pounds is C = (2x+10)/(x-5) where x is production units in thousands. Determine production levels where cost per unit is less than £3.