Linear Inequality Problems

Dr. S. White

Solve each inequality giving your answer as an inequality, in interval notation, and graph the solution set. Do not use a calculator. Work the odd problems, if you have any trouble whatsoever also do the even problems. Work all the review problems.

(1) $x + 3 < 7$

(2) $y - 5 < 6$

(3) $-2\,s > 6$

(4) $-3\,t < 12$

(5) $-3\,a - 6 \leq 0$

(6) $-2\,x + 8 \geq 0$

(7) $4\,x > -24$

(8) $6\,x \leq -18$

(9) $-0.9\,s \geq 9$

(10) $-0.3\,t > 6$

(11) $-11\,s \leq 5\,s - 8$

(12) $-5\,t > 7\,t - 3$

(13) $-3\,x > -15$

(14) $y \geq -3$

(15) $-3\,y - 5 \leq -11\,y + 6$

(16) $2\,a - 6 \geq -7\,a + 4$

(17) $-2\,x + 3 \geq 9$

(18) $-7\,y + 9 \leq 5$

(19) $-5\,y \leq 0$

(20) $-3\,x \geq 0$

(21) $-10 < 3\,x - 5$

(22) $-4 \leq 2\,y - 1$

(23) $3\,x < -2\,x$

(24) $2\,a \geq -7\,a$

(25) $-5\,(a - 2) + 7 < 2\,a + 1$

(26) $-4\,(x + 1) + 6 \leq 3\,x - 1$

(27) $-3\,x - 3 < 3\,x - 12$

(28) $-4\,a + 2 > 4\,a - 6$

(29) $-3\,(x + 1) \geq 0$

(30) $2\,(y - 1) < 0$

(31) $3\,(2\,x - 1) \leq 21$

(32) $2\,(3\,s - 1) \geq 4$

(33) $-2\,x - 5 < -12$

(34) $-3\,y - 2 \leq -10$

(35) $-2\,x + 4 \geq -6$

(36) $-3\,y + 8 < -4$

(37) $2\,s \leq \dfrac{1}{2}$

(38) $3\,t \geq \dfrac{1}{3}$

(39) $-2\,(2\,x - 3) + 4 < 1$

(40) $-2\,(3\,y - 2) + 5 > 2$

(41) $2\,(x - 3) \geq 3\,(x + 1)$

(42) $3\,(y - 20) \leq 2\,(y - 1)$

(43) $-5\,(y + 2) + 4\,(y - 2) \leq 0$

(44) $2\,(x + 3) + 3\,(x - 1) > 0$

(45) $\dfrac{-2\,x}{3} < 6$

(46) $\dfrac{-5\,a}{2} \geq 3$

(47) $-8\,(-x - 2) + 2 > -2\,x - 3$

(48) $-3\,(-a - 3) + 4 \leq -a - 2$

(49) $\dfrac{x}{6} > \dfrac{1}{2}$

(50) $\dfrac{-3\,y}{10} < \dfrac{1}{3}$

(51) $1.2\,x + 0.3 > 2.7$

(52) $3.4\,a - 0.5 \leq 9.7$

(53) $-0.5\,a \leq a + 4.5$

(54) $-0.2\,b > -b - 0.4$

(55) $0.2\,t > 0.3$

(56) $0.5\,x > 0.7\,x$

(57) $\dfrac{x+2}{2} - \dfrac{x}{3} < 1$

(58) $\dfrac{y}{3} + \dfrac{y-10}{2} < 2$

The following are review problems. Work all of them.

(59) $-12\,x < -18$

(60) $-3\,b + 4 \geq 2\,b + 1$

(61) $-3\,x - 4 \geq 3\,x - 5$

(62) $-5\,s \geq -4\,s$

(63) $-2\,a \leq 4$

(64) $-6\,(a+2) + 7 > 3\,(a-1)$

(65) $\dfrac{y}{6} > \dfrac{1}{6}$

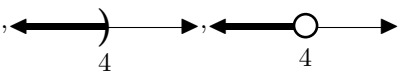
(66) $3.2\,x - 4.2 \leq 5.4$

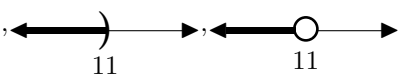
(67) $-5\,(2\,s-3) \leq 0$

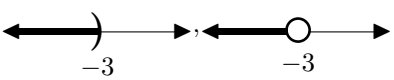
(68) $\dfrac{a-1}{3} + \dfrac{-2\,a-3}{5} > 2$

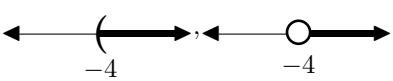
(69) $4.3\,x - 1.2 \geq -1.2\,x + 9.8$

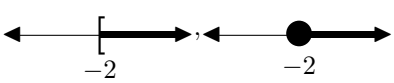
(70) $4\,(2\,b+1) - 3\,(b-1) < 3$

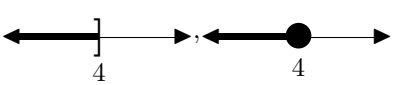
Answers: (1) $x < 4, (-\infty, 4),$ 

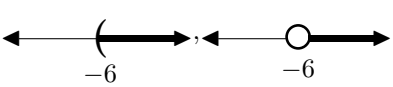
(2) $y < 11, (-\infty, 11),$ 

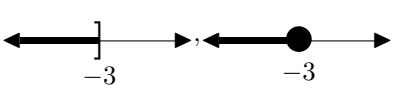
(3) $s < -3, (-\infty, -3),$ 

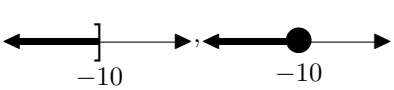
(4) $t > -4, (-4, \infty),$ 

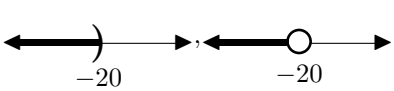
(5) $a \geq -2, [-2, \infty),$ 

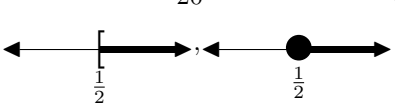
(6) $x \leq 4, (-\infty, 4],$ 

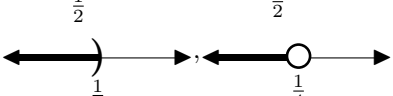
(7) $x > -6, (-6, \infty),$ 

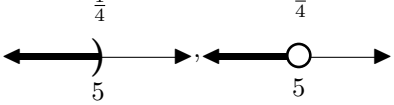
(8) $x \leq -3, (-\infty, -3],$ 

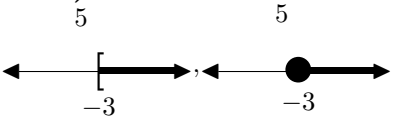
(9) $s \leq -10, (-\infty, -10],$ 

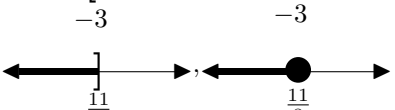
(10) $t < -20, (-\infty, -20),$ 

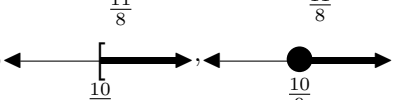
(11) $s \geq \frac{1}{2}, [\frac{1}{2}, \infty),$ 

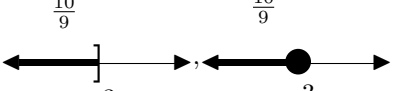
(12) $t < \frac{1}{4}, (-\infty, \frac{1}{4}),$ 

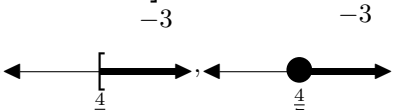
(13) $x < 5, (-\infty, 5),$ 

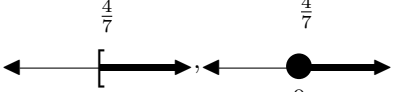
(14) $y \geq -3, [-3, \infty),$ 

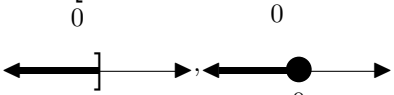
(15) $y \leq \frac{11}{8}, (-\infty, \frac{11}{8}],$ 

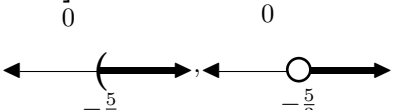
(16) $a \geq \frac{10}{9}, [\frac{10}{9}, \infty),$ 

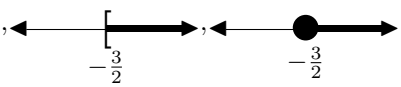
(17) $x \leq -3, (-\infty, -3],$ 

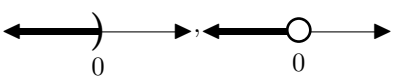
(18) $y \geq \frac{4}{7}, [\frac{4}{7}, \infty),$ 

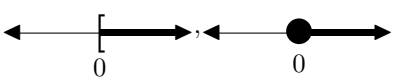
(19) $y \geq 0, [0, \infty),$ 

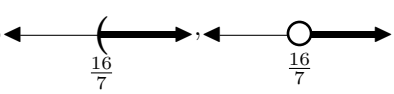
(20) $x \leq 0, (-\infty, 0],$ 

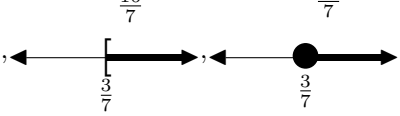
(21) $x > -\frac{5}{3}, (-\frac{5}{3}, \infty),$ 

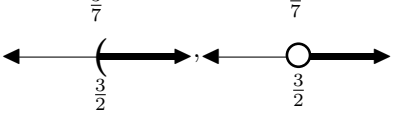
(22) $y \geq -\frac{3}{2}, [-\frac{3}{2}, \infty),$ 

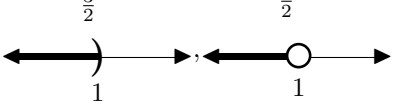
(23) $x < 0, (-\infty, 0),$ 

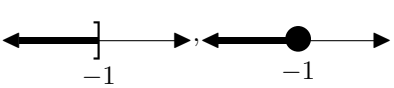
(24) $a \geq 0, [0, \infty),$ 

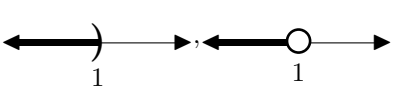
(25) $a > \frac{16}{7}, (\frac{16}{7}, \infty),$ 

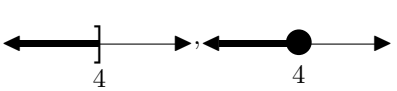
(26) $x \geq \frac{3}{7}, [\frac{3}{7}, \infty),$ 

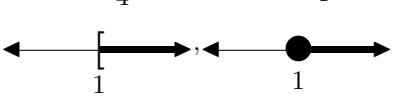
(27) $x > \frac{3}{2}, (\frac{3}{2}, \infty),$ 

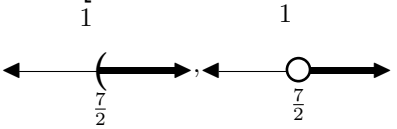
(28) $a < 1, (-\infty, 1),$ 

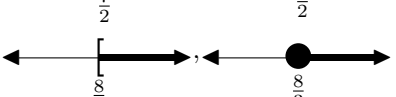
(29) $x \leq -1, (-\infty, -1],$ 

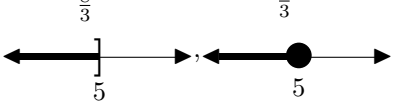
(30) $y < 1, (-\infty, 1),$ 

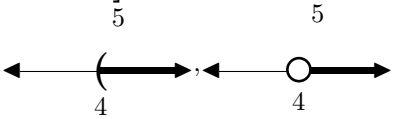
(31) $x \leq 4, (-\infty, 4],$ 

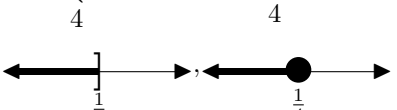
(32) $s \geq 1, [1, \infty),$ 

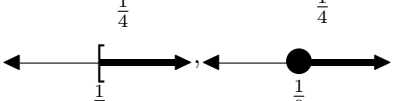
(33) $x > \frac{7}{2}, (\frac{7}{2}, \infty),$ 

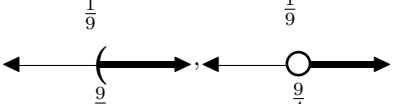
(34) $y \geq \frac{8}{3}, [\frac{8}{3}, \infty),$ 

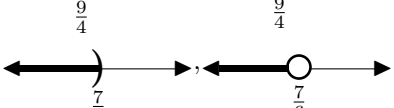
(35) $x \leq 5, (-\infty, 5],$ 

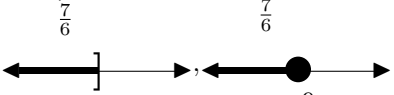
(36) $y > 4, (4, \infty),$ 

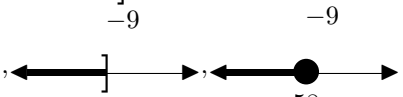
(37) $s \leq \frac{1}{4}, (-\infty, \frac{1}{4}],$ 

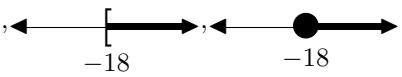
(38) $t \geq \frac{1}{9}, [\frac{1}{9}, \infty),$ 

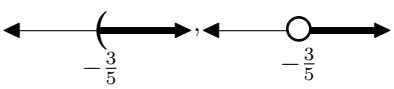
(39) $x > \frac{9}{4}, (\frac{9}{4}, \infty),$ 

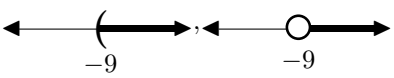
(40) $y < \frac{7}{6}, (-\infty, \frac{7}{6}),$ 

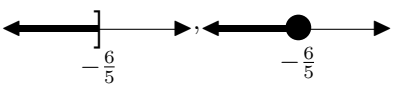
(41) $x \leq -9, (-\infty, -9],$ 

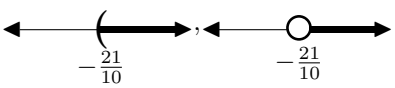
(42) $y \leq 58, (-\infty, 58],$ 

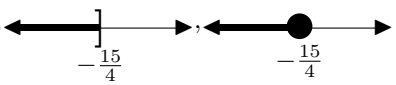
(43) $y \geq -18, [-18, \infty),$ 

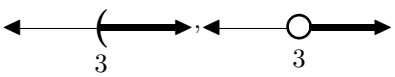
(44) $x > -\frac{3}{5}, (-\frac{3}{5}, \infty),$ 

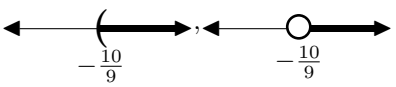
(45) $x > -9, (-9, \infty),$ 

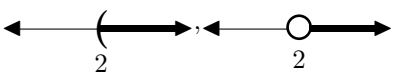
(46) $a \leq -\frac{6}{5}, (-\infty, -\frac{6}{5}],$ 

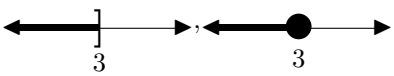
(47) $x > -\frac{21}{10}, (-\frac{21}{10}, \infty),$ 

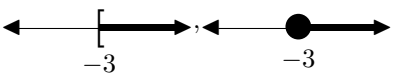
(48) $a \leq -\frac{15}{4}, (-\infty, -\frac{15}{4}],$ 

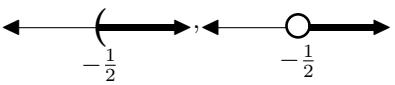
(49) $x > 3, (3, \infty),$ 

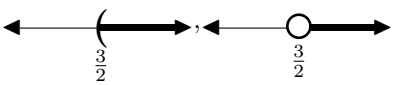
(50) $y > -\frac{10}{9}, (-\frac{10}{9}, \infty),$ 

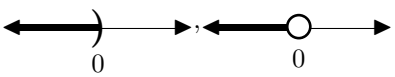
(51) $x > 2, (2, \infty),$ 

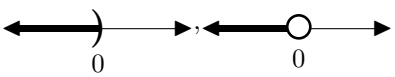
(52) $a \leq 3, (-\infty, 3],$ 

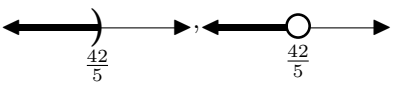
(53) $a \geq -3, [-3, \infty),$ 

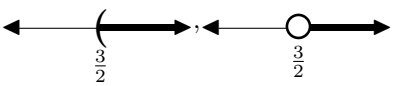
(54) $b > -\frac{1}{2}, (-\frac{1}{2}, \infty),$ 

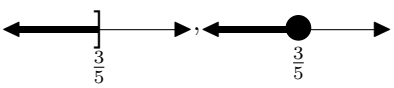
(55) $t > \frac{3}{2}, (\frac{3}{2}, \infty),$ 

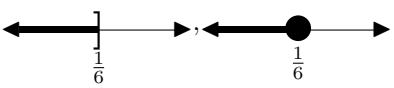
(56) $x < 0, (-\infty, 0),$ 

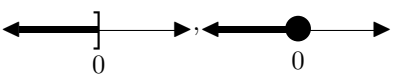
(57) $x < 0, (-\infty, 0),$ 

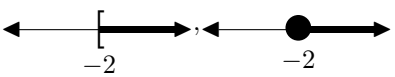
(58) $y < \frac{42}{5}, (-\infty, \frac{42}{5}),$ 

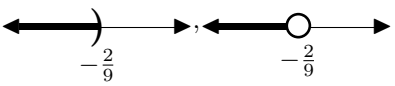
(59) $x > \frac{3}{2}, (\frac{3}{2}, \infty),$ 

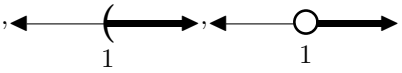
(60) $b \leq \frac{3}{5}, (-\infty, \frac{3}{5}],$ 

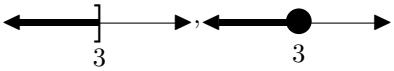
(61) $x \leq \frac{1}{6}, (-\infty, \frac{1}{6}],$ 

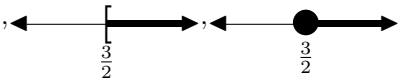
(62) $s \leq 0, (-\infty, 0],$ 

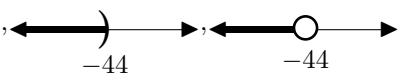
(63) $a \geq -2, [-2, \infty),$ 

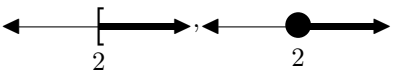
(64) $a < -\frac{2}{9}$,$(-\infty, -\frac{2}{9})$, 

(65) $y > 1$,$(1, \infty)$, 

(66) $x \leq 3$,$(-\infty, 3]$, 

(67) $s \geq \frac{3}{2}$,$[\frac{3}{2}, \infty)$, 

(68) $a < -44$,$(-\infty, -44)$, 

(69) $x \geq 2$,$[2, \infty)$, 

(70) $b < -\frac{4}{5}$,$(-\infty, -\frac{4}{5})$,