

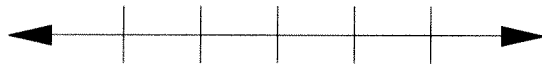
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Sec. 6.3: Solve Multi-Step Inequalities

Solve multi-step inequalities just as you would solve multi-step equations—using inverse operations—but keep in mind that any time you multiply or divide each side of an inequality by a negative number, you need to reverse the direction of the inequality symbol.

Examples

1. Solve $2x + 5 < 11$. Graph your solution.

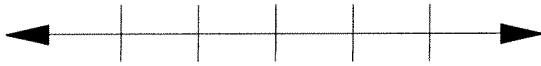


2. Solve $-3(x + 4) \geq 9$. Graph your solution.



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3. Solve $2(k + 8) > 3(k - 4)$. Graph your solution.



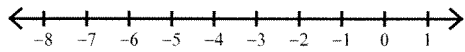
4. Solve $-3y + 8 > -3(y + 2)$, if possible.

5. Solve $6(x + 2) < 3(2x - 5)$, if possible.

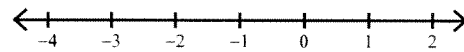
Sec. 6.3 Practice: Solve Multi-Step Inequalities

Solve each inequality and graph its solution.

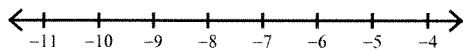
1) $11 < p - 7 - 7p$



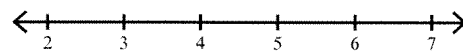
2) $-4 + 4n - 6 > -10$



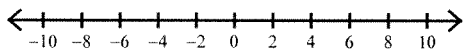
3) $-24 \geq 6x - 2x$



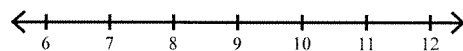
4) $21 > 1 - 3m + 7m$



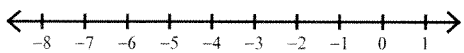
5) $-6x - 3 \leq -3 - 6x$



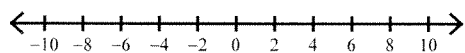
6) $b - 4 + 7 > 3b - 13$



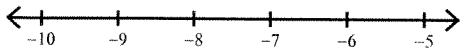
7) $-10 + 2r - 7r \geq -2r - 1$



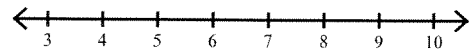
8) $2n - 3 \leq -3 + 2n$



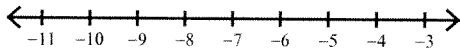
$$9) 3(4n - 1) < -87$$



$$10) 7(-4x - 3) > -217$$



$$11) 225 > -5(3 + 8a)$$



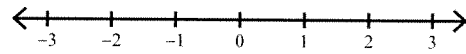
$$12) -182 > -7(3v + 5)$$



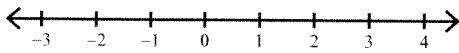
$$13) -6n + 6 < 8 + 4(5n + 6)$$



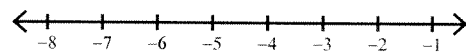
$$14) -6x - 18 < -6(8x + 3)$$



$$15) 8x + 28 \leq 7(3x + 4) - 5x$$



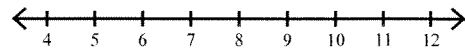
$$16) 6k + 36 < -3(5 + 2k) - 5k$$



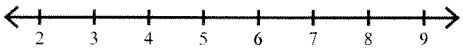
$$17) 2(p + 6) < -2(p + 4) + 4$$



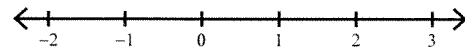
$$18) 4(x + 1) + 4 \geq -4x + 4(3x - 7)$$



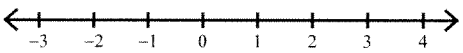
$$19) 5 + 4(5n + 5) < -5(-6n + 7) + 5n$$



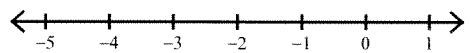
$$20) -2(m + 1) - 4 > -3(m + 2)$$



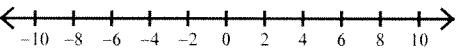
$$21) -3 + 3(r - 1) > -6(1 - 7r)$$



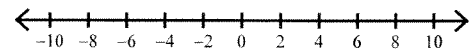
$$22) 2(-5x - 6) + 2(x - 4) \leq 5x - 3x$$



$$23) -3(-7n - 6) > 21n - 10$$



$$24) -4b + 12 > -4(b - 3)$$

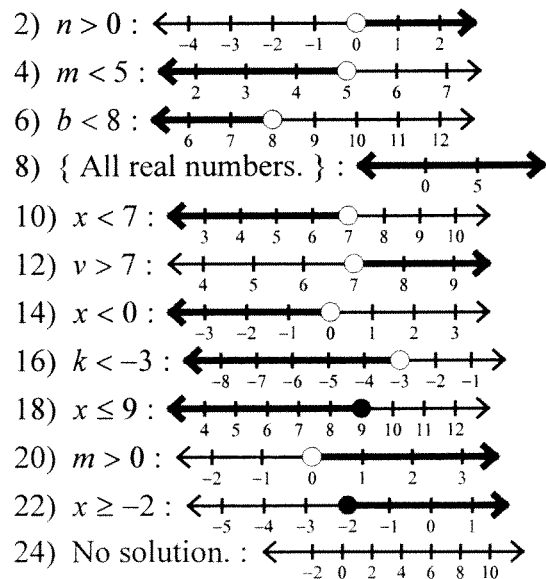
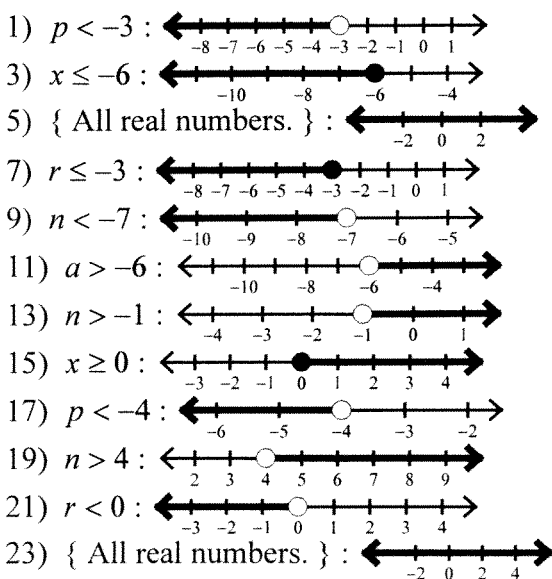


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25. You have \$35 to spend at an amusement park that charges \$10 for admission and \$3 per ride. Write an inequality that represents this situation. Solve the inequality to determine how many rides you can go on with the money you have to spend.

26. A food server earns \$50 in a shift plus 15% of all food bills. Write and solve an inequality to determine the total of food bills required in order for the server to earn at least \$100 for a shift.

Answers to Sec. 6.3 Practice Problems



25. $10 + 3r \leq 35$; $r \leq \frac{25}{3}$ or $r \leq 8\frac{1}{3}$
 $\Rightarrow r \leq 8$, because you cannot go on $\frac{1}{3}$ of a ride.

26. $50 + .15f \geq 100$; $f \geq \$333.34$. (Round up.)