$\qquad$ Date $\qquad$ Class $\qquad$

## 3-5. Solving Inequalities with Variables on Both Sides

Solve each inequality and graph the solutions.

1. $2 x+30 \geq 7 x$
2. $2 k+6<5 k-3$

3. $3 b-2 \leq 2 b+1$
4. $2(3 n+7)>5 n$

5. $5 s-9<2(s-6)$
6. $-3(3 x+5) \geq-5(2 x-2)$

7. $1.4 z+2.2>2.6 z-0.2$
8. $\frac{7}{8} p-\frac{1}{4} \leq \frac{1}{2} p$


Solve each inequality.
9. $v+1>v-6$
10. $3(x+4) \leq 3 x$
11. $-2(8-3 x) \geq 6 x+2$

Write and solve an inequality for each problem.
12. Ian wants to promote his band on the Internet. Site A offers website hosting for $\$ 4.95$ per month with a $\$ 49.95$ startup fee. Site B offers website hosting for $\$ 9.95$ per month with no startup fee. For how many months would lan need to keep the website for Site B to be less expensive than Site A?
13. For what values of $x$ is the area of the rectangle greater than the perimeter?


## Practice A

3-5 Solving Inequalities with Variables on Both Sides


Write and solve an inequality for each problem.
9. Jay can buy a stereo either online or at a local store. If he buys
online, he gets a $15 \%$ discount, but has to pay a $\$ 12$ shipping fee. At
the local store, the stereo is not on sale, but there is no shipping fee.
For what regular prices is it cheaper for Jay to buy the stereo online?
$p-0.15 p+12<p ; p>80 ;$ greater than $\$ 80$
10. For what values of $x$ is the area of the rectangle greater than the area of the triangle?

$$
6 x>\frac{1}{2}(4)(x+6) ; x>3
$$




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## Practice C

3-5 Solving Inequalities with Variables on Both Sides


## Practice B

Solving Inequalities with Variables on Both Sides

## Solve each inequality and graph the solutions.

$\begin{array}{ll}\text { 1. } 2 x+30 \geq 7 x & \text { 2. } 2 k+6<5 k-3\end{array}$



$$
\begin{aligned}
& \text { 3. } 3 b-2 \leq 2 b+1 \\
& \qquad \begin{array}{c}
b \leq 3 \\
\hline
\end{array}
\end{aligned}
$$

4. $2(3 n+7)>5 n$

5. $5 s-9<2(s-6)$
6. $-3(3 x+5) \geq-5(2 x-2)$



## Solve each inequality.

9. $v+1>v-6$
10. $3(x+4) \leq 3 x$
11. $-2(8-3 x) \geq 6 x+2$
all real numbers
no solutions no solutions

## Write and solve an inequality for each problem.

12. Ian wants to promote his band on the Internet. Site A offers website hosting for $\$ 4.95$ per month with a $\$ 49.95$ startup fee. Site B offers website hosting for $\$ 9.95$ per month with no startup fee. For how many months would lan need to keep the website for Site B to be less expensive than Site A?
$9.95 m<4.95 m+49.95$; $m<9.99$; for 0 to 9 months
13. For what values of $x$ is the area of the rectangle greater than the perimeter?
$7(x+2)>7+(x+2)+7+(x+2) ; x>0.8$
$\qquad$

## Reteach

Solving Inequalities with Variables on Both Sides
Variables must be collected on the same side of an inequality before the inequality can be solved. If you collect the variables so that the variable term is positive, you will not have to multiply or divide by a negative number.
Solve $x>8(x-7)$. Solve $x>8(x-7)$

Collect the variables on the left
$x>8(x-7)$
$x>8 x-56$ Distribute.
$-8 x-8 x \quad$ Add $-8 x$ to both sides.
$-7 x>-56$
$\frac{-7 x}{-7}>\frac{-56}{-7}$

|  | by -7. |
| :--- | :--- |
| $x<8$ | Reverse the sign. |

Notice that if you want to have the variable on the left to make graphing solutions easier, you may still need to switch the inequality sign, even if you did not multiply or divide by a negative number.

Write the first step you would take to solve each inequality if you wanted to keep the variable positive.

| $\text { 1. } 6 y<10 y+1$ | add $-6 y$ to both sides |  |
| :---: | :---: | :---: |
| 2. $4 p-2 \geq 3 p$ | add $-3 p$ to both sides |  |
| 3. $5-3 r \leq 6 r$ | add $3 r$ to both sides |  |
| Solve each inequality. |  |  |
| 4. $8 c+4>4(c-3)$ | 5. $5(x-1)<3 x+10-8 x$ | 6. $-8+4 a-12>2 a+10$ |
| $c>-4$ | $x<\frac{3}{2}$ | $a>15$ |
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