Warm Up

4. Find the solution set to each inequality. Express the solution in set notation.

$6m + 2 < 5m - 4$

$6m + 2 < 5m - 4$
$-5m \quad -5m$
$m + 2 < -4$
$-2 \quad -2$
$m < -6$

$\frac{x}{5} + 8 \le 13$

$\frac{x}{5} + 8 \le 13$
$-8 \quad -8$
$5\left(\frac{x}{5}\right) \le (5)5$
$x \le 25$

$-3(x - 7) > -27$

$\frac{-3(x-7)}{-3} > \frac{-27}{-3}$
$x - 7 < 9$
$+7 \quad +7$
$x < 16$

$8(p - 6) > 4(p - 4)$

$8p - 48 > 4p - 16$
$-4p \quad -4p$
$4p - 48 > -16$
$+48 \quad +48$
$\frac{4p}{4} > \frac{32}{4}$
$p > 8$

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$x < -6$ $\quad$ $x \le -6$

$-6 > x$ $\quad$ $-6 \ge x$

$x > 2$

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$x \le 35$	$x \le 12$	$x > 3$
$x \le 10$	$x > 32$	$x \ge 10$

Statement	
A student will study German for at least 3 years.	$G \ge 3$
All employees work less than 40 hours.	$W < 40$
There are at least 35 people in the emergency room.	$P \ge 35$
The carton holds at most 12 eggs.	$E \le 12$
There are no more than 10 gallons of gas in the tank.	$G \le 10$
There are fewer than 10 yards of fabric left.	$F < 10$
The temperature is above 32°F.	$T > 32$
Years of experience cannot be less than 5 years.	$Y \ge 5$

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Fernando have at most 2 cookies

$F \le 2$

Kareem asked for at least \$5

$K \ge 5$

Kenneth spends no more than 1 hour playing Xbox

$K \le 1$

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the diagrams below.

Graph 1: $x > -2$ $\quad$ $-2 < x$

Graph 2: $x \ge -2$ $\quad$ $-2 \le x$

Graph 3: $x < -2$ $\quad$ $-2 > x$

Graph 4: $x \le -2$ $\quad$ $-2 \ge x$

inequality for each graph shown above:

Graph 2:

Graph 4:

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Review

Zero Product Property

$(x+8)(x+11) = 0$

$x + 8 = 0$
$-8 \quad -8$
$x = -8$

or

$x + 11 = 0$
$-11 \quad -11$
$x = -11$

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Example

$x(x-3)(2x+5)=0$

$\{0, 3, -\frac{5}{2}\}$

$2x+5=0$
$-5 \quad -5$
$\frac{2x}{2} = \frac{-5}{2}$
$x = -\frac{5}{2}$

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Example Zero Product Property

$2x(3x+1)(x-4)=0$

$\{0, -\frac{1}{3}, 4\}$

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1) $2x + 30 \geq 7x$
$-2x \qquad -2x$
$\frac{30}{5} \geq \frac{5x}{5}$
$6 \geq x$

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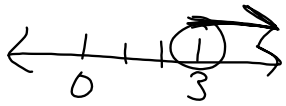
2) $2k + 6 < 5k - 3$
$-2k \qquad -2k$
$6 < 3k - 3$
$+3 \qquad +3$
$\frac{9}{3} < \frac{3k}{3}$
$3 < k$



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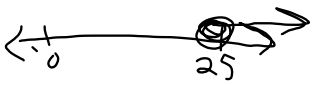
6) $-3(3x+5) \geq -5(2x-2)$
$-9x - 15 \geq -10x + 10$
$+10x \qquad +10x$
$x - 15 \geq 10$
$+15 \qquad +15$
$x \geq 25$



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7) $1.4x + 2.2 > 2.6x - .2$
$-1.4x \qquad -1.4x$
$2.2 > 1.2x - .2$
$+.2 \qquad +.2$
$\frac{2.4}{1.2} > \frac{1.2x}{1.2}$
$2 > x$

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8)

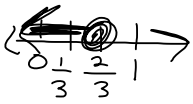
$$8\left(\frac{7}{8}p - \frac{1}{4} \le \frac{1}{2}p\right)$$

$$7p - 2 \le 4p$$
$$-7p \qquad -7p$$

$$\frac{-2}{-3} \le \frac{-3p}{-3}$$

$$\boxed{\frac{2}{3} \ge p}$$

$$\boxed{p \le \frac{2}{3}}$$



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$$\frac{7}{8}p - \frac{1}{4} \le \frac{1}{2}p = \frac{4}{8}$$
$$-\frac{7}{8}p \qquad -\frac{7}{8}p$$

$$\left(-\frac{8}{3}\right)\left(-\frac{1}{4}\right) \le -\frac{3}{8}p\left(-\frac{8}{3}\right)$$

$$\frac{2}{3} \ge p$$

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$$v + 1 > v - 6$$
$$-v \qquad -v$$

$$1 > -6$$

True So → All Real #'s

$\mathbb{R}$

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$$3(x+4) \le 3x$$

$$3x + 12 \le 3x$$
$$-3x \qquad -3x$$

$$12 \le 0$$

False Because 12 is NOT ≤ 0

$\boxed{\text{No Solution}}$

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11) $-2(8-3x) \ge 6x+2$

$$-16 + 6x > 6x + 2$$

$$-16 > 2$$

False $\boxed{\text{No Solution}}$

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p129 on Your TexTbook on Website

GUIDED PRACTICE

Solve each inequality and graph the solutions.

1. $2x > 4x - 6$
2. $7y + 1 \le y - 5$
3. $27x + 33 > 58x - 29$
4. $-3r < 10 - r$
5. $5c - 4 > 8c + 2$
6. $4.5x - 3.8 \ge 1.5x - 2.3$
7. **School** The school band will sell pizzas to raise money for new uniforms. The supplier charges \$100 plus \$4 per pizza. If the band members sell the pizzas for \$7 each, how many pizzas will they have to sell to make a profit?

Solve each inequality and graph the solutions.

8. $5(4 + x) \le 3(2 + x)$
9. $-4(3 - p) > 5(p + 1)$
10. $2(6 - x) < 4x$
11. $4x > 3(7 - x)$
12. $\frac{1}{2}f + \frac{3}{4} \ge \frac{1}{4}f$
13. $-36.72 + 5.65t < 0.25t$

Solve each inequality.

14. $2(x - 2) \le -2(1 - x)$
15. $4(y + 1) < 4y + 2$
16. $4v + 1 < 4v - 7$
17. $b - 4 \ge b - 6$
18. $3(x - 5) > 3x$
19. $2k + 7 \ge 2(k + 14)$

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