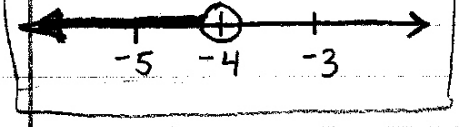
Chapter 1.5 Solving Inequalities

Solve each inequality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

(47) $\frac{-7w}{-7} > \frac{28}{-7}$

$w < -4$

$\{w \mid w < -4\}$



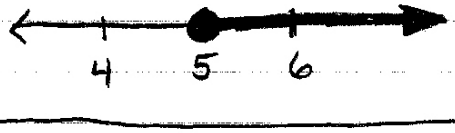
(48) $3x + 4 \geq 19$

$-4 \quad -4$

$\frac{3x}{3} \geq \frac{15}{3}$

$x \geq 5$

$\{x \mid x \geq 5\}$



Students need to know:

Solve inequalities the same way as equations, except: when multiplying or dividing both sides by a negative, flip the sign.

$< >$

↑ open circle (excludes number)

$\geq \leq$

↑ closed circle (includes number)

Chapter 1.5 continued

(49) $\frac{n}{12} + 5 \leq 7$

$-5 \quad -5$

$\frac{n}{12} \leq 2$

$12 \cdot \frac{n}{12} \leq 2 \cdot 12$

$n \leq 24$

$\{n \mid n \leq 24\}$

(50) $3(6-5a) < 12a - 36$

$18 - 15a < 12a - 36$

$+15a \quad +15a$

$18 < 27a - 36$

$+36 \quad +36$

$\frac{54}{27} < \frac{27a}{27}$

Chapter 1.5 continued

(51) $2-3z \geq 7(8-2z)+12$

$2-3z \geq 56-14z+12$

$2-3z \geq 56+12-14z$

$2-3z \geq 68-14z$

$+14z \qquad +14z$

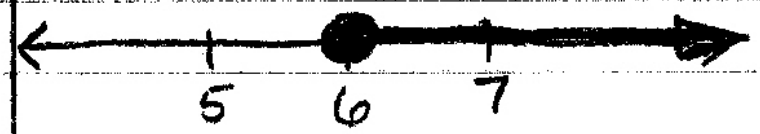
$2+11z \geq 68$

$-2 \qquad -2$

$\frac{11z}{11} \geq \frac{66}{11}$

$z \geq 6$

$\{z \mid z \geq 6\}$



(52) $8(2x-1) > 11x-17$

$16x-8 > 11x-17$

$-11x \qquad -11x$

$5x-8 > -17$

$+8 \qquad +8$

$\frac{5x}{5} > \frac{-9}{5}$

Chapter 1.5 continued

(53) A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.

Let x = the number of toppings

$$6(9 + 1.25x) \leq 75$$
$$54 + 7.50x \leq 75$$
$$-54 \qquad -54$$
$$\frac{7.50x}{7.5} \leq \frac{21}{7.5}$$
$$x \leq 2.8$$

so there has to be less than 2.8 toppings...

The group can order a maximum of 2 toppings per pizza

Assignment 1.5
Solving Inequalities

Solve each in equality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

$\frac{-7w}{-7} > \frac{28}{-7}$

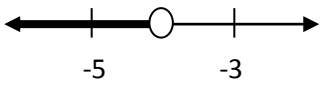
$w <$ ▢

$\{w|w <$ ▢ $\}$

28 ÷ -7 = ▢

A) {w|w < -4}

B) {w|w < 4}



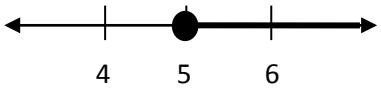
3x + 4 ≥ 19
-4 -4

$\frac{3x}{3} \geq \frac{15}{3}$

A) {x|x ≥ 5}
B) {x|x ≥ 15}

x ≥ ▢

$\{x|x \geq$ ▢ $\}$



Choice Strategy

Assignment 1.5
Solving Inequalities

$\frac{n}{12} + 5 \leq 7$

$\frac{-5 \quad -5}{\frac{n}{12} \leq 2}$

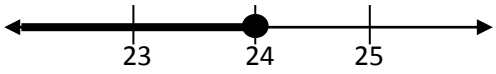
$12 \bullet \frac{n}{12} \leq 2 \bullet 12$

$n \leq \square$

A) n | n ≤ 24

B) n | n ≥ 24

$\{n \mid n \leq \square\}$



$3(6 - 5a) < 12a - 36$
$18 - 15a < 12a - 36$
$+15a \quad +15a$
$18 < 27a - 36$
$+36 \quad +36$
$\frac{54}{27} < \frac{27a}{27}$

$\square < a$

A) 2 < a

B) 27 < a

$2 - 3z \geq 7(8 - 2z) + 12$
$2 - 3z \geq 56 - 14z + 12$
$2 - 3z \geq 56 + 12 - 14z$
$2 - 3z \geq 68 - 14z$
$+14z \quad +14z$
$2 + 11z \geq 68$
$-2 \quad -2$
$\frac{11z}{11} \geq \frac{66}{11}$

$z \geq \square$

$\{z \mid z \geq \square\}$

A) z | z ≥ 6

B) z | z ≥ 10

Choice Strategy

Assignment 1.5
Solving Inequalities

$8(2x - 1) > 11x - 17$

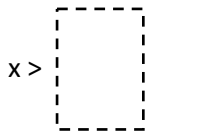
$16x - 8 > 11x - 17$

$-11x \quad -11x$

$5x - 8 > -17$

$+8 \quad +8$

$\frac{5x}{5} > \frac{9}{5}$



$x >$

A) $x > 9/5$

B) $x > 3$

PIZZA

A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.

Let x = the number of toppings.

A) $x \leq 2.8$
B) $x \leq 2$

$6(9+1.25x) \leq 75$

$54+ 7.50x \leq 75$

$-54 \quad -54$

$\frac{7.50x}{7.50} \leq \frac{21}{7.50}$

$x \leq$ ___

so there has to be less than _____ toppings…

The group can order a maximum of 2 toppings per pizza.

Choice Strategy

Assignment 1.5
Solving Inequalities

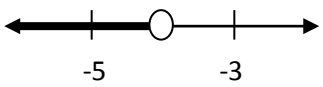
Solve each in equality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

$\frac{-7w}{-7} > \frac{28}{-7}$

$w <$ ■

$\{w|w <$ ■ $\}$

28 ÷ -7 = ■



3x + 4 ≥ 19
-4 -4

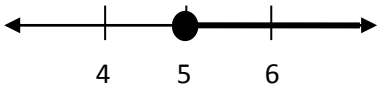
$\frac{3x}{3} \geq \frac{15}{3}$

x ≥ ■

$\{x|x \geq$ ■ $\}$

19 – 4 = 15

15 ÷ 3 = ■



Assignment 1.5
Solving Inequalities

$\frac{n}{12} + 5 \leq 7$

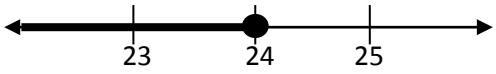
$\frac{-5 \quad -5}{\frac{n}{12} \leq 2}$

$12 \bullet \frac{n}{12} \leq 2 \bullet 12$

$n \leq$ ☐

2 ● 12 = ☐

$\{n | n \leq$ ☐ $\}$



$3(6 - 5a) < 12a - 36$
$18 - 15a < 12a - 36$
$+15a \quad +15a$
$18 < 27a - 36$
$+36 \quad +36$
$\frac{54}{27} < \frac{27a}{27}$

☐ < a

54 ÷ 27 = ☐

$2 - 3z \geq 7(8 - 2z) + 12$
$2 - 3z \geq 56 - 14z + 12$
$2 - 3z \geq 56 + 12 - 14z$
$2 - 3z \geq 68 - 14z$
$+14z \quad +14z$
$2 + 11z \geq 68$
$-2 \quad -2$
$\frac{11z}{11} \geq \frac{66}{11}$

$z \geq$ ☐

$\{z | z \geq$ ☐ $\}$

66 ÷ 11 = ☐

Assignment 1.5
Solving Inequalities

$8(2x - 1) > 11x - 17$

$16x - 8 > 11x - 17$

$-11x \quad -11x$

$5x - 8 > -17$

$+8 \quad +8$

$\frac{5x}{5} > \frac{9}{5}$

$x >$ ☐

PIZZA

A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.

Let x = the number of toppings.

$6(9 + 1.25x) \leq 75$

$54 + 7.50x \leq 75$

$-54 \quad -54$

$\frac{7.50x}{7.50} \leq \frac{21}{7.50}$

$x \leq$ ☐

$21 \div 7.50 =$ ☐

so there has to be less than ☐ toppings…

The group can order a maximum of 2 toppings per pizza.

Closed Last Steps Strategy

Assignment 1.5
Solving Inequalities

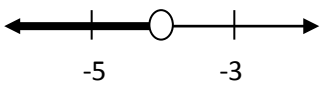
Solve each in equality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

$\frac{-7w}{-7} > \frac{28}{-7}$

$w <$ ☐

28 ÷ -7 = ☐

$\{w|w <$ ☐ $\}$



3x + 4 ≥ 19

-4 -4

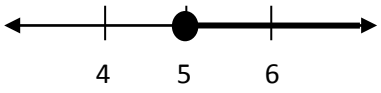
$\frac{3x}{3} \geq \frac{☐}{3}$

x ≥ ☐

19 – 4 = ☐

☐ ÷ 3 = ☐

$\{x|x \geq$ ☐ $\}$



$\frac{n}{12} + 5 \leq 7$

-5 -5

$\frac{n}{12} \leq$ ☐

7 –5 = ☐

Closed Strategy

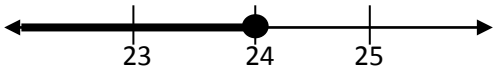
Assignment 1.5
Solving Inequalities

$12 \bullet \frac{n}{12} \leq 2 \bullet 12$

$n \leq$ ☐

2 ● 12 = ☐

$\{n | n \leq$ ☐ $\}$



$3(6 - 5a) < 12a - 36$
$18 - 15a < 12a - 36$
$+15a \quad +15a$
$18 < ☐ - 36$
$+36 \quad +36$
$\frac{54}{27} < \frac{27a}{27}$

☐ < a

12a + 15a = ☐

54 ÷ 27 = ☐

$2 - 3z \geq 7(8 - 2z) + 12$
$2 - 3z \geq 56 - 14z + 12$
$2 - 3z \geq 56 + 12 - 14z$
$2 - 3z \geq 68 - 14z$
$+14z \quad +14z$
$2 + ☐ \geq 68$
$-2 \quad -2$
$\frac{☐}{11} \geq \frac{☐}{11}$

z ≥ ☐

$\{z | z \geq$ ☐ $\}$

-3z + 14z = ☐

68 – 2 = ☐

☐ ÷ 11 = ☐

Assignment 1.5
Solving Inequalities

$8(2x - 1) > 11x - 17$

$16x - 8 > 11x - 17$

$-11x \quad -11x$

$\square - 8 > -17$

$+8 \quad +8$

$\frac{5x}{5} > \frac{\square}{5}$

$x > \square$

$16x - 11x = \square$

$-17 + 8 = \square$

PIZZA

A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.

Let x = the number of toppings.

$6(9 + 1.25x) \leq 75$

$\square + 7.50x \leq 75$

$- \square \quad - \square$

$\frac{\square x}{\square} \leq \frac{21}{\square}$

$x \leq \square$

$6 \bullet 9 = \square$

$6 \bullet 1.25 = \square$

$75 - \square = \square$

$\square \div \square = \square$

so there has to be less than $\square$ toppings…

The group can order a maximum of 2 toppings per pizza.

Assignment 1.5
Solving Inequalities

Solve each in equality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

$-7w > 28$

$3x + 4 \geq 19$

$n/12 + 5 \leq 7$

$3(6 – 5a) < 12a – 36$

$2 – 3z \geq 7(8 - 2z) +12$

$8 (2x – 1) > 11x – 17$

PIZZA
A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.

Open Ended

Assignment 1.5
Solving Inequalities

Solve each in equality. Describe the solution set using set builder notation. Then graph the solution set on a number line.

$-7w > 28$

$3x + 4 \geq 19$

$n/12 + 5 \leq 7$

$3(6 - 5a) < 12a - 36$

$2 - 3z \geq 7(8 - 2z) + 12$

$8(2x - 1) > 11x - 17$

PIZZA
A group has $75 to order 6 large pizzas each with the same amount of toppings. Each pizza costs $9 plus $1.25 per topping. Write and solve an inequality to determine how many toppings the group can order on each pizza.