Name _____ Date _____ Class _____

LESSON 2-8

Problem Solving

Solving Absolute-Value Equations and Inequalities

Gita's science class is making a set of posters about North American wildlife. The table shows some of the data collected.

North American Wildlife		
Weight Groups (kg)	**Animal**	**Daily Food Requirement (kg)**
W_3 135–450	Grizzly bear	10.5
	Polar bear	9.9
	Black bear	3.9
W_2 10–90	Mule deer	2.8
	Arctic wolf	2.3
	River otter	0.8
W_1 3–8	Nutria	0.38
	Opossum	0.19
	Rabbit	0.18

1. What is the center of each weight group?

Solution:

Step 1. Find the range. $8 - 3 = 5$

Step 2. Divide by 2. $5 \div 2 = 2.5$

Step 3. Add to the lowest value. $3 + 2.5 = 5.5$

2. Express each weight group as an absolute-value expression.

a. W_1 $|W_1| - 5.5| \leq 2.5$

b. W_2 _____

c. W_3 _____

3. Write inequalities to show the amount of food required each day for animals in each weight group.

a. W_1 $f \geq 0.18$ and $f \leq 0.38$

b. W_2 _____

c. W_3 _____

4. Gita wants to use the term *disjunction* or *conjunction* on her poster showing the inequalities. Which term should she use? Why?

_____

5. Solve this equation to find the number of kilograms of food consumed each day by an animal in one of the weight groups:

$$|f - 7.2| \leq 3.3.$$

_____

Name _____ Date _____ Class _____

LESSON 2-8

Problem Solving

Solving Absolute-Value Equations and Inequalities

Gita's science class is making a set of posters about North American wildlife. The table shows some of the data collected.

North American Wildlife		
Weight Groups (kg)	**Animal**	**Daily Food Requirement (kg)**
W_3 135–450	Grizzly bear	10.5
	Polar bear	9.9
	Black bear	3.9
W_2 10–90	Mule deer	2.8
	Arctic wolf	2.3
	River otter	0.8
W_1 3–8	Nutria	0.38
	Opossum	0.19
	Rabbit	0.18

1. What is the center of each weight group?

Solution:

Step 1. Find the range. $8 - 3 = 5$

Step 2. Divide by 2. $5 \div 2 = 2.5$

Step 3. Add to the lowest value. $3 + 2.5 = 5.5$

2. Express each weight group as an absolute-value expression.

a. W_1 $|W_1| - 5.5| \leq 2.5$

b. W_2 $|W_2 - 50| \leq 40$

c. W_3 $|W_3 - 292.5| \leq 157.5$

3. Write inequalities to show the amount of food required each day for animals in each weight group.

a. W_1 $f \geq 0.18$ and $f \leq 0.38$

b. W_2 $f \geq 0.8$ and $f \leq 2.8$

c. W_3 $f \geq 3.9$ and $f \leq 10.5$

4. Gita wants to use the term *disjunction* or *conjunction* on her poster showing the inequalities. Which term should she use? Why?

Conjunction; Possible answer: the compound statement uses the term *and*.

5. Solve this equation to find the number of kilograms of food consumed each day by an animal in one of the weight groups:

$|f - 7.2| \leq 3.3.$

$f \geq 3.9$ and $f \leq 10.5$; $3.9 \leq f \leq 10.5$