Unit 4 "Quest" – Inequalities (and Equations)

Section 1: Solving Equations

Solve for the missing values in the following equations.

1.) $-2x = 40$

$x = -20$

2.) $64 = x + 5$

$x = 59$

3.) $54 = -3v + 39$

$v = -5$

4.) $\frac{x}{-3} = 9$

$x = -27$

Simplify and Solve

Solve for the missing values in the following equations.

5.) $-4(x + 5) = 8$

$-4x - 20 = 8 \qquad x = -7$

6.) $25 = 9 + 4(3w + 7)$

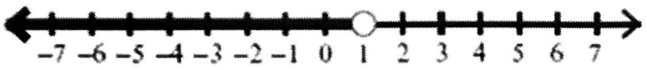
$25 = 9 + 12w + 28$

$w = -1$

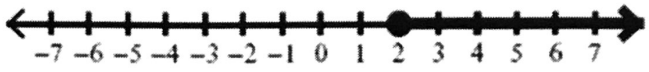
Section 2: Inequalities (Basic)

#1-2. Write an inequality for each graph.

1.) $x < 1$

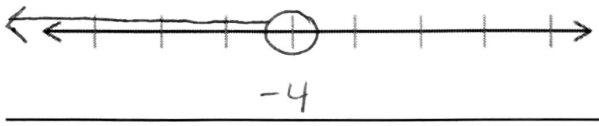


2.) $x \geq 2$

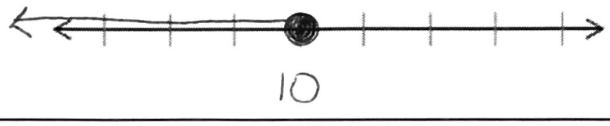


#3-4: Graph the inequality given.

3.) $x < -4$



4.) $10 \geq x$



Section 3: Inequalities (Plug in)

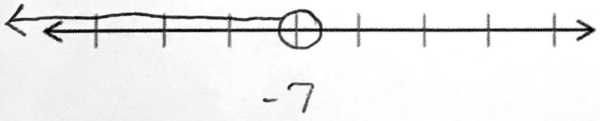
There are three inequalities listed in the first column. Each of the other columns contain a number. Determine if the number given in the column heading is a solution to the inequality.
Select **all** that apply.

	-10	0	10	20
$y > -8$		✓	✓	✓
$3x - 8 \geq 11$			✓	✓
$-3m > 21$	✓			

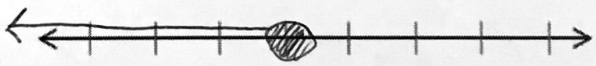
Section 4: Solving Inequalities

Solve the following inequalities and graph the solution on a number line.

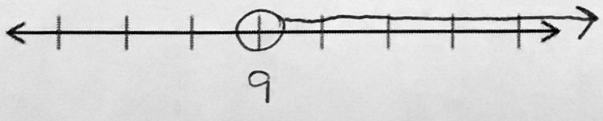
1.) $14 < -2x$ $-7 > x$



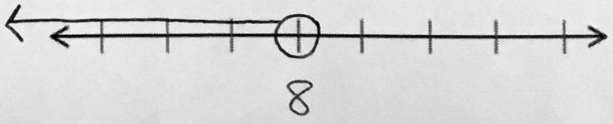
2.) $2x + 1 \leq 17$ $x \leq 8$



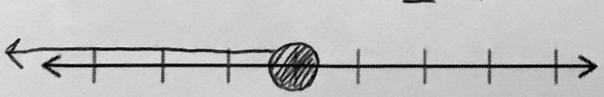
3.) $\frac{x}{-3} + 2 < -1$ $x > 9$



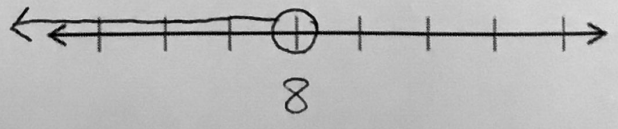
4.) $-4 > x - 12$ $8 > x$



5.) $-12 \geq \frac{x}{3}$ $-36 \geq x$



6.) $5(x + 3) < 55$ $x < 8$



Section 5: Equation Word Problems

Create an equation based on the following situation and then solve the equation to help find your answer.

1.) Raymond buys bottles of water at $2 each and a large pizza at $13. The total cost was $21. Write an equation. How many bottles of water did Raymond buy?

$2b+13 = 21$ $\quad b = 4$

2.) On Monday, 166 students went on a trip to the zoo. All 4 buses were filled and 10 students had to travel in cars. Write an equation. How many students were in each bus ?

$166 = 4x+10$ $\quad$ 39 students

3.) Mary buys a apples at the farmer's market for d dollars each. She spends a total of t dollars on apples. Create an equation that represents the relationship between a and t.

$ad = t$ or $da = t$ or $\frac{t}{a} = d$ or $\frac{t}{d} = a$

4.) Dominic bought 1 bag of chips and 4 bags of candy for a total of $9.71.

- The bag of chips cost 2.15
- The bags of candy each cost the same amount (as each other).

What amount did Dominic pay for each bag of candy?

$2.15 + 4b = 9.71 \quad b = 1.89$

6) The perimeter of the rectangle is 104. Find the value of c. Then find the length and width.

Equation $12c - 4 = 104$

c = 9

Length = 37

Width = 15

Section 6: Inequality Word Problems

#1: Create an inequality to represent the situation. (You do not have to solve it.)

1) Marcus has a pool that can hold a maximum of 3500 gallons of water. The pool already contains 1200 gallons of water. Marcus begins to add more water at a rate of 40 gallons per minute.
Write an inequality that shows the number of minutes, m, Marcus can continue to add water to the pool without exceeding the maximum number of gallons.

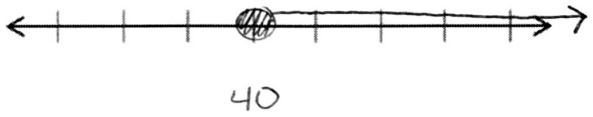
$1200 + 40m \leq 3500$

#2-4: Create an solve inequalities for the following word problems:

2) At her job, Jessie earns $10.50 per hour. She also earns a $50 bonus every month. Jessie needs to earn at least $470 every month. Write, solve, and graph an inequality to find the number of hours Jessie must work each month to make at least $470.

$10.50h + 50 \geq 470$

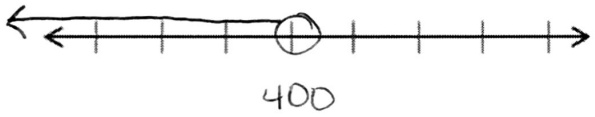
$h \geq 40$



3) For her cell phone plan, Heather pays $50 per month plus $0.05 per text. She wants to keep her bill under $70 per month. Write, solve, and graph an inequality to find the number of texts Heather can send each month while staying within her budget.

$50 + 0.05t < 70$

$t < 400$



4) **Each** student in Ms. Clark's class is decorating a shirt for a school program.
There are 30 students in the class. Ms. Clark already has 3 shirts. She will buy shirts in packages of 8 shirts. She cannot buy part of a package.

Part A

Create an inequality using only the given numbers to represent this situation, where p represents the number of packages of shirts.

$3 + 8p \geq 30$

Part B

What is the minimum number of whole packages of shirts that Ms. Clark needs to buy?

$p \geq 3.375$ so 4 packages