**Module 1: Basic Skills of Algebraic Expressions**

**Lesson 6: Solving Compounds Inequalities**

**Objectives:**

* **Students can solve algebraic compound inequalities.**
* **Students can solve inequalities joined by “and” or “or”.**
* **Students can graph the solutions of compound inequalities on the number line.**
* **Students can write the solution of a compound inequality in an interval notation.**

**Agenda:**

* **Quiz**
* **Warm Up: A blast from the past**
* **Notes: Solving compound inequalities.**
* **Practice:**

**Vocabulary:**

* **Inequalities signs, inequalities joined by “and” or “or”, compound inequalities,**

**Focus Questions:**

1. **What is the solution set for inequalities joined by “and”?**
2. **What is the solution set for inequalities joined by “or”?**

**Video:**

[**https://www.khanacademy.org/math/algebra/linear\_inequalities/compound\_absolute\_value\_inequali/v/compound-inequalities**](https://www.khanacademy.org/math/algebra/linear_inequalities/compound_absolute_value_inequali/v/compound-inequalities)

**Homework: HW 2-6**

**Do you remember your skills?**

1. **Consecutive integers:**

The sum of two consecutive odd integers is 36. Find the integers.

1. **Coin problems**

Toni has 11 more nickels than quarters in her purse. How many coins does she have if the total value of her coins is $2.65?

1. **Literal Equations Solve for  r :**

$V= π r^{2}h$

1. Write an appropriate inequality Or inequalities to represent the following solution sets.
2. B)

 

**C)** D)

** **

**White board activity:**

[**https://www.ixl.com/math/algebra-1/graph-compound-inequalities**](https://www.ixl.com/math/algebra-1/graph-compound-inequalities)

[**https://www.ixl.com/math/algebra-1/write-compound-inequalities-from-graphs**](https://www.ixl.com/math/algebra-1/write-compound-inequalities-from-graphs)

[**https://www.youtube.com/watch?v=0hBo6ISpW9s**](https://www.youtube.com/watch?v=0hBo6ISpW9s) **(end 4:33)**

We learned that the solution set of the inequality is all the values that make the inequality a true statement.

**Solving Compound Inequalities**

1. Solve the following inequalities and graph them on the same number line:

 $ 5q + 10 > 20$ $-6(q+ 5) \geq 30$

1. What do you think the solution set is if we connect both inequalities with “or”?

b. The Above solution set can be represented in an **interval notation:**

|  |  |
| --- | --- |
| Solution Set Graph | Interval Notation |
|  |  |
|  |  |
|  |  |
|  |  |

1. Try these now:

 $8y + 4>7y-2$ AND $\frac{m}{3}+8\leq 9$

1. What about this compound inequality? Think about what it means first, then solve it, and express the solution set graphically and in an interval notation

$$-5<2x+ 1<4$$

4)Solve the following And inequality and graph it on the number line. Represent your solution set in an interval Notation.$-1 \leq 3 – 2x \leq 10$

Applied problem:

1. Lisa brought half of her savings to the bakery and bought croissants for $14.20. The amount of money she brings home with her is more than $2. Use an inequality to find least money she had in her savings before going to the bakery. (Write the inequalities that represents the situation and solve it.)

Summary: Things you should know about at the end of the last two lessons:

At least/At most/Inequality number property when you divide or multiply by a negative, Interval Notation, compound inequality using “And” , “OR”, Open circles vs closed.

**Mathematician: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**HW 2-6**

**Express th following compound inequalities graphically and in an interval notation:**

1. $x<1 or x\geq 4$ 2. $x\leq 4 and x\geq 0$

3.Match the inequalities to their appropriate intevral notation and their appropriate graphs.

|  |  |  |
| --- | --- | --- |
|  | $x<-1 or x\geq 5$  | (-4, 3] |
|  | $$-3<x<2$$ | (-8, 2)  |
|  | $x<-4 or x\geq 3$  | (-1, 5] |
|  | $$-8<x<2$$ | (-3, 2)  |

Appropriate Matching:

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

4. **Write a compound inequality for each scenario.**

A) The scores on the last test ranged from $65\%$ to $100\%$.

1. To ride the roller coaster, one must be at least $4$ feet tall, and 6.6 feet at most.
2. Unsafe body temperatures are those lower than 96**°**F or above 104**°**F.
3. Students are to present a persuasive speech in English class. The guidelines state that the speech must be at least $7$ minutes but not exceed $12$ minutes.
4. **Find the solution set for the following inequalities and express the solution set graphically on the number line and in an interval:**

|  |  |
| --- | --- |
| 1. $x- 4 > 0$ or $3x- 6 \leq -18$

  | 1. $3(x-6) < 3$ and $5-x = 2$

  |
| 1. $4x- 9 \geq 3$ and $-3x + 5 \geq 2$
 | 1. $-5\leq 2x+1<5$
 |

**Challenge yourself:**

1. **Solve and express the solution set graphically on the number line and in an interval:**

$2\left(x-4\right)\geq 6x+4-3x> 2(x+5)$

1. A school is taking a field trip with 195 students and 10 adults. Each bus can hold at most 40 students. We need to determine the smallest number of busses needed for the trip.

1. Find the sum of $3x^{2}-2x+6$ and $5x^{2}-3$?
2. Express $(x-2)^{2}$as a trinomial
3. Simplify $(-3x^{3}y^{-5})^{2}$