Inequality Unit:
High School Placement Test Review
Problem Sets

Name: KEY _____ **Hour:** _____

Major Objectives (Students will…):

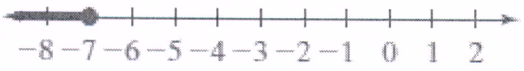
- Graph and write inequalities.
- Solve equations using inequalities (1 step and multi-step equations).
- Solve and graph compound inequalities.

HOMEWORK: Graphing & Writing Inequalities

Write an inequality for each sentence.

1. The total t is less than sixteen. $t < 16$
2. A number h is not less than 7. $h \geq 7$
3. The price p is less than or equal to \$25. $p \leq \$25$
4. A number n is negative. $n < 0$

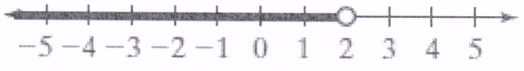
Write an inequality for each graph.

5. 

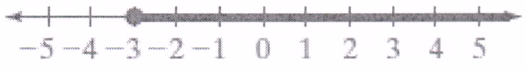
$x \leq -7$

6. 

$x > 0$

7. 

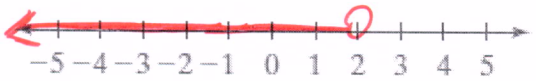
$x < -1$

8. 

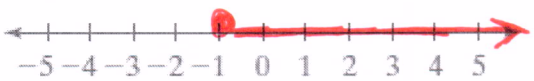
$x \geq -3$

Graph the solutions of each inequality on a number line.

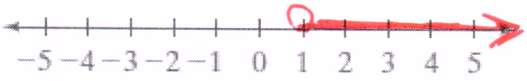
9. $x < -2$



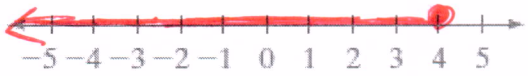
10. $y \geq -1$



11. $k > 1$



12. $p \leq 4$



Write an inequality for each situation. Use the variable given.

13. Everyone in the class is under 13 years old. Let x be the age of a person in the class.

$x < 13$

14. The speed limit is 60 miles per hour. Let s be the speed of a car driving within the limit.

$s \leq 60$

15. You have \$4.50 to spend on lunch. Let c be the cost of your lunch.

$c \leq \$4.50$

HOMEWORK: Multi-Step Inequalities

Solve the inequalities. Show your work!

1. $y - 2 < -7$

$y < -5$

2. $v + 6 > 5$

$v > -1$

3. $12 \geq c - 2$

$14 \geq c$

4. $8 \leq f + 4$

$4 \leq f$

5. $-y - 4 + 2y > 11$

$y > 15$

6. $\frac{2}{3} + v - \frac{7}{9} \geq 0$

$v \geq \frac{1}{9}$

7. $-2p - 4 + 3p > 10$

$p > 14$

8. $5m - 4m + 4 > 12$

$m > 8$

Write an inequality and solve for the story problems.

9. The goal of a toy drive is to donate more than 1000 toys. The toy drive already has collected 300 toys. How many more toys does the toy drive need to meet its goal? Write and solve an inequality to find the number of toys needed.

$x > 760$ TOYS

10. To go to the next level in a certain video game, you must score at least 50 points. You currently have 40 points. You fall into a trap and lose 5 points. What inequality shows the points you must earn to go to the next level?

$x \geq 15$ POINTS

Solve each inequality. Show your work.

11. $-2.5 > 5p$

$-.5 > p$

12. $-1 < \frac{t}{6}$

$-6 < t$

13. $\frac{2}{3}n \leq 4$

$n \leq 6$

14. $-27u \geq 3$

$v \leq -\frac{1}{9}$

Set up an inequality and solve.

15. You wonder if you can save money by using your cell phone for all long distance calls. Long distance calls cost $.05 per minute on your cell phone. The basic plan for your cell phone is $29.99 each month. The cost of regular phone service with unlimited long distance is $39.99. Define a variable and write an inequality that will help you find the number of long-distance call minutes you may make and still save money.

$M < 200$ MINUTES

16. The unit cost for a piece of fabric is $4.99 per yard. You have $30 to spend on material. How many feet of material could you buy? Define a variable and write an inequality to solve this problem.

$x \leq 18$ FEET

17. $3f + 9 < 21$ $f \leq 4$

18. $4n - 3 \geq 105$ $n \geq 27$

19. $12 > 60 - 6r$ $r > 8$

20. $-5 \leq 11 + 4j$ $j \geq -4$

21. $-x + 2 < 3x - 6$ $x > 2$

22. $3v - 12 > 5v + 10$ $v < -11$

23. $-2(6 + s) < -16 + 2s$ $s > 1$

24. $15(j - 3) + 3j < 45$ $j < 5$

25. $22 \geq 5(2y + 3) - 3y$ $y \leq 1$

26. $9 - 2x < 7 + 2(x - 3)$ $x > 2$

27. A family decides to rent a boat for the day while on vacation. The boat's rental rate is \$500 for the first two hours and \$50 for each additional half hour. Suppose the family can spend \$700 for the boat. What inequality represents the number of hours for which they can rent the boat?

$x \leq 4$ HOURS

28. A grandmother says her grandson is two years older than her granddaughter and that together, they are at least 12 years old. How old are her grandson and granddaughter?

7 YEARS OLD 5 YEARS OLD

HOMEWORK: Compound Inequalities

Solve each compound inequality. Graph your solutions.

1. $5 < k - 2 < 11$

$7 < k < 13$

2. $-4 > y + 2 > -10$

$-12 < y < -6$

3. $6b - 1 \leq 41$ or $2b + 1 \geq 11$

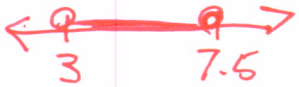
$b \leq 7$ OR $b \geq 5$

4. $5 - m < 4$ or $7m > 35$

$m > 1$ OR $m > 5$

3. $3 < 2p - 3 \leq 12$

$3 < p \leq \frac{15}{2}$



6. $3 > \frac{11+k}{4} \geq -3$

$-23 < k \leq 1$

Write each interval as an inequality. Then graph the solutions.

7. $(-1, 10]$

$-1 < x \leq 10$

8. $[-3, 3]$

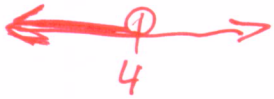
$-3 \leq x \leq 3$

9. $(-\infty, 0]$ or $(5, \infty)$

$x \leq 0$ OR $x > 5$

10. $(-\infty, 4)$

$x < 4$



Write each inequality or set in interval notation. Then graph the interval.

11. $x < -2$

$(-\infty, -2)$

12. $x > 0$

$(0, \infty)$

13. $x < -2$ or $x \geq 1$

$(-\infty, -2)$ OR $[1, \infty)$

14. $-3 \leq x < 4$

$[-3, 4)$

HOMEWORK: Absolute Value Equations & Inequalities

Solve each equation. Graph and check your solutions.

1. $|n| + 2 = 5$

$n = -3$ or 3

2. $4 = |s| - 3$

$s = -7$ OR 7

3. $7|d| = 49$

$d = -7$ OR 7

4. $2 = \left|m + \frac{2}{3}\right|$

$m = \frac{-8}{3}$ OR $\frac{4}{3}$

Solve each equation. If there is no solution, write *no solution*.

5. $|r - 9| = -3$

NO SOLUTION

6. $1 = |g + 3|$

$g = -2$ OR -4

7. $-2|3d| = 4$

NO SOLUTION

8. $4|v - 5| = 16$

$v = 9$ OR 1

9. $3|d - 4| = 12$

$d = 8$ OR 0

10. $|3f + 0.5| - 1 = 7$

$f = 2.5$ OR $-3.1\overline{6}$

Solve and graph each inequality.

11. $|x| > 1$

$x > 1$ or $x < -1$

12. $|x + 3| < 10$

$-14 < x < 7$

13. $|y - 1| \leq 8$

$-7 \leq x \leq 9$

14. $|p - 6| \geq 5$

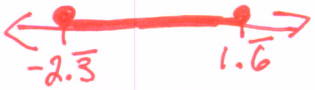
$p \leq 1$ OR $p \geq 11$

15. $|3c - 4| > 12$

$c < -2.\overline{6}$ OR $c > 5.3$

16. $\left|2t + \frac{2}{3}\right| \leq 4$

$-2.\overline{3} \leq x \leq 1.\overline{6}$



Solve each equation or inequality. If there is no solution, write *no solution.*

17. $1.5|3p| = 4.5$

$P = 1$ OR -1

18. $\left|d + \frac{2}{3}\right| + \frac{3}{4} = 0$

NO SOLUTION

19. $7|3y - 4| - 8 \leq 48$

$-1.\overline{3} \leq x \leq 4$

20. $|9d| > 6.3$

$x < -0.7$ OR $x > 0.7$

21. $\frac{|y|}{4} < 3$

$-12 < x < 12$

22. $|t| - 1.2 = 3.8$

$t = 5$ OR -5

Write an absolute value inequality that represents each set of numbers.

23. all real numbers less than 3 units from 0

$|x| < 3$

24. all real numbers at most 6 units from 0

$|x| \leq 6$

25. all real numbers more than 4 units from 6

$|x - 6| > 4$

26. all real numbers at least 3 units from –2

$|x + 2| \geq 3$

27. In a sports poll, 53% of those surveyed believe their high school football team will win the state championship. The poll shows a margin of error of ±5 percentage points. Write and solve an absolute value inequality to find the least and the greatest percent of people that think their team will win the state championship.

$|x - 53| \leq 5$

$48 \leq x \leq 58$