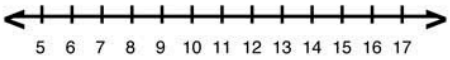
Name: Date:

WORKSHEET :

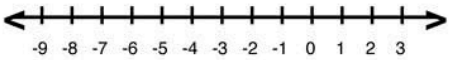
Inequalities

Solve and Graph the Inequalities

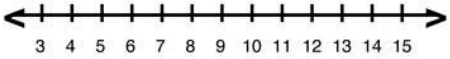
1) $4y - 112 < 4(5 - 2y)$



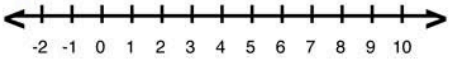
2) $6s + 5s > -44$



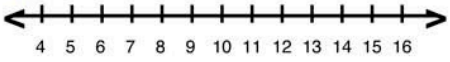
3) $4(3 - 5h) \geq 8h - 128$



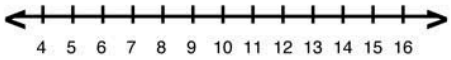
4) $-18 \geq -3b - 11 + 2b$



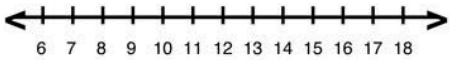
5) $40 > 2d + 3d$



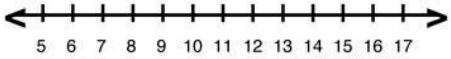
6) $9c - 268 < 4(3 - 5c) - 6c$



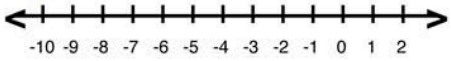
7) $5x - 150 \geq 5(6 - 2x) - 3x$



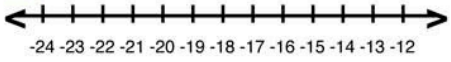
8) $4(2 - 5a) - 3a \leq 10a - 223$



9) $-3p - 6 + 4p > -14$



10) $4v - 8 + 5v < -188$

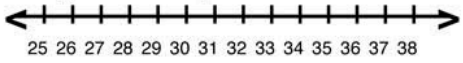


WORKSHEET :

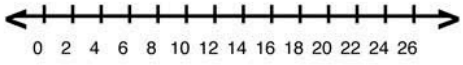
Compound Inequalities
AND/OR

Solve and Graph the Inequalities

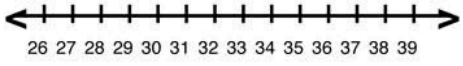
1) $\frac{j}{3} \leq 9$ or $\frac{j}{7} \geq 5$



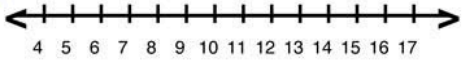
2) $12n < 48$ or $6n > 96$



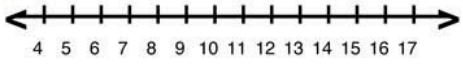
3) $\frac{c}{3} < 9$ or $\frac{c}{7} > 5$



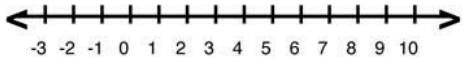
4) $11d \leq 55$ or $7d \geq 105$



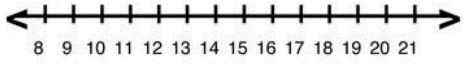
5) $x - 4 < 1$ or $x + 5 > 16$



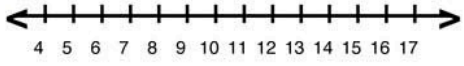
6) $q - 3 < -5$ or $q + 6 > 12$



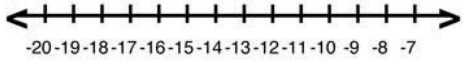
7) $2b \leq 18$ or $b + 7 \geq 19$



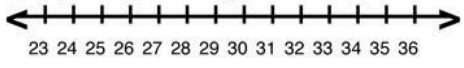
8) $3r \leq 18$ or $r + 2 \geq 14$



9) $-6 \leq s + 13 \leq 3$



10) $\frac{a}{3} \geq 8$ and $\frac{a}{6} \leq 5$

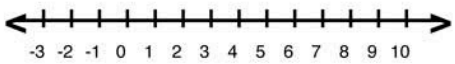


WORKSHEET :

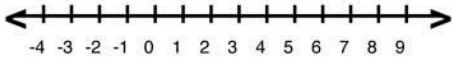
Inequalities & Absolute Value

Solve and Graph the Inequalities

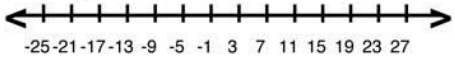
1) $|p - 2| \leq 3$



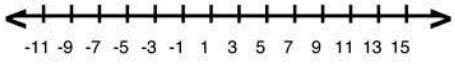
2) $|-2r| < 6$



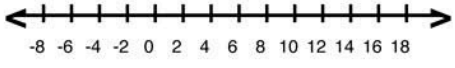
3) $\left|\frac{j}{4}\right| \geq 6$



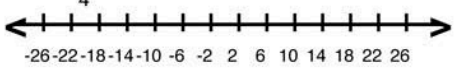
4) $|3s + 6| > 24$



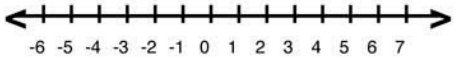
5) $|c| + 1 < 7$



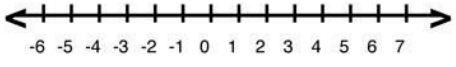
6) $\left|\frac{g}{4}\right| > 6$



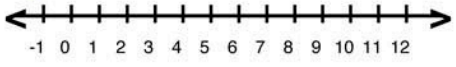
7) $|a| + 9 > 5$



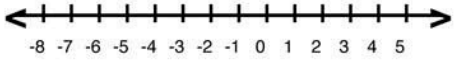
8) $|4f| \geq 16$



9) $|n - 3| \geq 3$



10) $|b + 4| > 3$

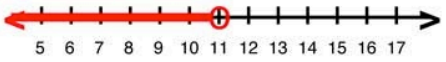


ANSWERS :

Inequalities

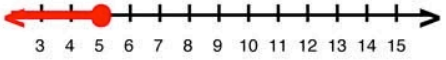
Solve and Graph the Inequalities

1) $y < 11$

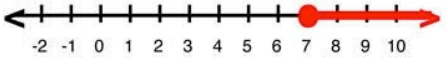


2) $s > -4$

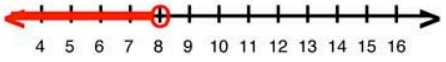
3) $h \leq 5$



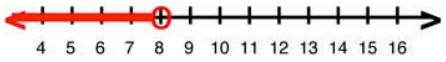
4) $b \geq 7$



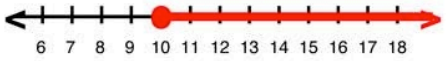
5) $d < 8$



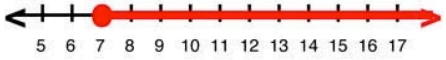
6) $c < 8$



7) $x \geq 10$

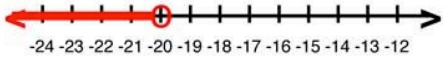


8) $a \geq 7$



9) $p > -8$

10) $v < -20$

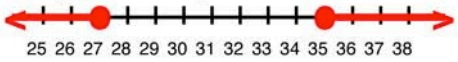


ANSWERS :

Compound Inequalities
AND/OR

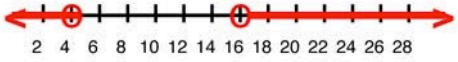
Solve and Graph the Inequalities

1) $\frac{j}{3} \leq 9$ or $\frac{j}{7} \geq 5$



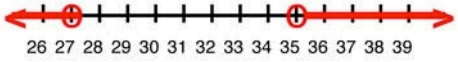
$j \leq 27$ or $j \geq 35$

2) $12n < 48$ or $6n > 96$



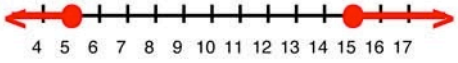
$n < 4$ or $n > 16$

3) $\frac{c}{3} < 9$ or $\frac{c}{7} > 5$



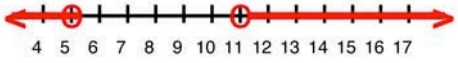
$c < 27$ or $c > 35$

4) $11d \leq 55$ or $7d \geq 105$



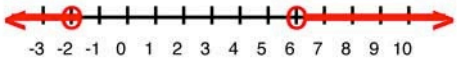
$d \leq 5$ or $d \geq 15$

5) $x - 4 < 1$ or $x + 5 > 16$



$x < 5$ or $x > 11$

6) $q - 3 < -5$ or $q + 6 > 12$

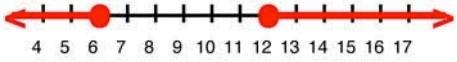


$q < -2$ or $q > 6$

7) $2b \leq 18$ or $b + 7 \geq 19$

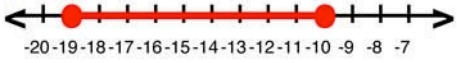
$b \leq 9$ or $b \geq 12$

8) $3r \leq 18$ or $r + 2 \geq 14$



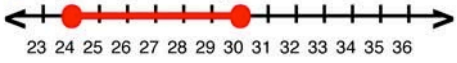
$r \leq 6$ or $r \geq 12$

9) $-6 \leq s + 13 \leq 3$



$-19 \leq s \leq -10$

10) $\frac{a}{3} \geq 8$ and $\frac{a}{6} \leq 5$



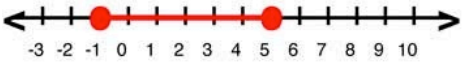
$24 \leq a \leq 30$

ANSWERS :

Inequalities & Absolute Value

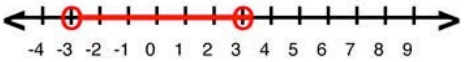
Solve and Graph the Inequalities

1) $|p - 2| \leq 3$



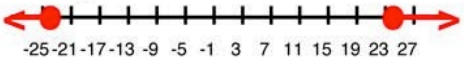
$-1 \leq p \leq 5$

2) $|-2r| < 6$



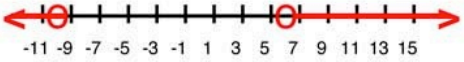
$-3 < r < 3$

3) $\left|\frac{j}{4}\right| \geq 6$



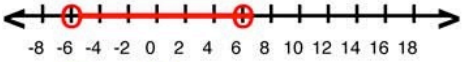
$j \geq 24$ or $j \leq -24$

4) $|3s + 6| > 24$



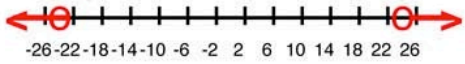
$s > 6$ or $s < -10$

5) $|c| + 1 < 7$



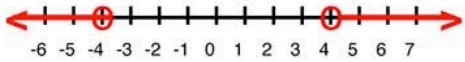
$-6 < c < 6$

6) $\left|\frac{g}{4}\right| > 6$



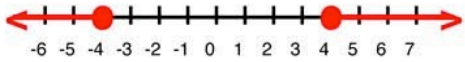
$g > 24$ or $g < -24$

7) $|a| + 9 > 5$



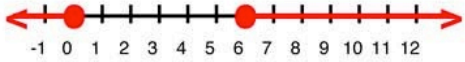
$a > 4$ or $a < -4$

8) $|4f| \geq 16$



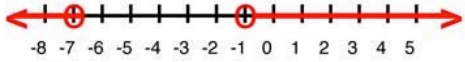
$f \geq 4$ or $f \leq -4$

9) $|n - 3| \geq 3$



$n \geq 6$ or $n \leq 0$

10) $|b + 4| > 3$



$b > -1$ or $b < -7$

KEY CONCEPTS:

Inequalities are similar to equations in that the value of two expressions are compared, but instead of being equal the inequality symbols ($>,<,\geq,\leq$) indicate one expression has a higher or lower value or could possibly also be equal. Students must learn to solve inequalities, understand the differences versus solving equations, and graph the results.

1. The general methods and approach for solving inequalities is the same as for equations with some key exceptions.

    a. **If dividing/multiplying by a negative value on both sides then the direction of the inequality symbol must be changed.**
    b. If taking the reciprocal of entire sides then the direction of the inequality symbol must change.
    c. It is not possible to divide both sides of an inequality by a variable because unlike an equation the positive or negative value of the variable which is unkown makes it impossible to determine what the direction of the inequality symbol should be. As a result, there may be no solution to inequalities unless alternate methods to solve exist.

2. Students should learn to graph one variable inequalities on the number line and understand the difference between "and" (intersection) and "or" (union) conditions for compound inequalities.

    a. ($>,<$) symbols indicate an open circle on the number line graph to exclude the endpoint value.
    b. ($\geq,\leq$) symbols indicate a closed circle on the number line graph to include the endpoint value.
    c. Inequality graphs such as $3<x<6$ ($x>3$ and $x<6$) indicate intersections of two inequalities. Alternatively, $x>6$ or $x<3$ is the union of two constraints that does not include results in between.
    d. Two variable and multi-variable inequalities can also be graphed, but they are beyond the scope of the exam requirements. If confronted with two variable inequalities students often should look to test the multiple choice answers.

3. Inequality problems on the exam often appear paired with absolute value expressions providing multiple constraints (inequality solutions). Students should practice and gain mastery of solving compound absolute value inequalities.