Properties of Inequality Handout

Inequality Symbols :

$>$ **Greater Than**

$\geq$ **Greater Than or Equal To**

(The line underneath the Greater Than sign indicates also Equal To.)

$<$ **Less Than**

$\leq$ **Less Than or Equal To**

(The line underneath the Less Than sign indicates also Equal To.)

Graphing Inequality Symbols :

 **Greater Than**

(The open circle indicates that this is **NOT EQUAL TO** the number that is graphed.)

 **Greater Than or Equal To**

(The closed circle indicates that this is **EQUAL TO** the number that is graphed.)

 **Less Than**

(The open circle indicates that this is **NOT EQUAL TO** the number that is graphed.)

 **Less Than or Equal To**

(The closed circle indicates that this is **EQUAL TO** the number that is graphed.)

Properties of Inequality Handout

Multiplication Property :

If $x < y$, and $z > 0$ then $x * z < y * z$

Example :

Suppose $3 < 6$, and $z = 10$

then $3 * 10 < 6 * 10$ or $30 < 60$

If $x > y$, and $z > 0$, then $x * z > y * z$

Example :

Suppose $20 > 10$, and $z = 5$

then $20 * 5 > 10 * 5$ or $100 > 50$

Whenever you multiply by a negative number, you must reverse the inequality sign.

If $x < y$, and $z < 0$ then $x * z > y * z$

Example :

Suppose $2 < 4$, and $z = -2$

then $2 * -2 > 4 * -2$ or $-4 > -8$

If $x > y$, and $z < 0$, then $x * z < y * z$

Example :

Suppose $6 > 3$, and $z = -8$

then $6 * -8 < 3 * -8$ or $-48 < -24$

Properties of Inequality Handout

Division Property :

If $x < y$, and $z > 0$ then $x \div z < y \div z$

Example :

Suppose $15 < 20$, and $z = 5$

then $15 \div 5 < 20 \div 5$ or $3 < 4$

If $x > y$, and $z > 0$, then $x \div z > y \div z$

Example :

Suppose $20 > 10$, and $z = 5$

then $20 \div 5 > 10 \div 5$ or $4 > 2$

Whenever you divide by a negative number, you must reverse the inequality sign.

If $x < y$, and $z < 0$ then $x \div z > y \div z$

Example :

Suppose $12 < 24$, and $z = -2$

then $12 \div -2 > 24 \div -2$ or $-6 > -12$

If $x > y$, and $z < 0$, then $x \div z < y \div z$

Example :

Suppose $16 > 12$, and $z = -4$

then $16 \div -4 < 12 \div -4$ or $-4 < -3$