Al Mahdi High School *Mathematics* *10^{th}-Grade*

Name: . . . . *" Framing & comparing of Real numbers"* *W.S-4*

I- Choose with justification the only correct answer:

No.	*Propositions*	*Expected Answers*		
		a	*b*	*c*
1.	If $-2\le x\le 3$, then	$-3\le \frac{1}{x-1}\le 2$	$-\frac{1}{3}\le \frac{1}{x-1}\le \frac{1}{2}$	$\frac{1}{x-1}$ Can't be framed in this case
2.	If $x\in[2;5]$ and $1\le y\le 3$ then	$-\frac{24}{3}\le \frac{-x^2+1}{y}\le -3$	$-8\le \frac{-x^2+1}{y}\le -1$	$-24\le \frac{-x^2+1}{y}\le -1$

II- In each case, give a framing of: $x+y;\ x-y;\ xy;\ \frac{x}{y}$ *then* x^2.

a. $2\le x\le 5$ & $4\le y\le 8$.

b. $-5\le x\le -2$ & $4\le y\le 8$.

c. $-3<x<-1$ & $-5<y<-2$.

★ *d.* $-3<x<2$ & $1<y<5$

III- Given that: $-1\le x\le 3$ & $0<y<1$. Encircle $x-y$ *and* $y-x$.

IV- Given that: $1\le a\le 2$ & $2\le b\le 3$. Enclose $\frac{1}{b}$ *then* $\frac{a}{b}$.

V- Given that: $\frac{2}{3}<r<\frac{3}{2}$ & $-2<n<-1$.

a) Bound $-n, 1-n, \& 3r$.

b) Deduce the framing of: $-r\cdot n, r\cdot n, then \frac{1-n}{1+3r}$.

VI- Given: $I=[1;3], J=[4;5] \& K=3|x-y|+|3x-2y+8|$

a. If $x\in I \& y\in J$, then frame: $x-y \& 3x-2y+8$

b. Write the expression K without absolute value.

VII- Given: $5\le x\le 8$ & $-3\le y<-2$

a) Frame: $x+y$, $x-y$ then, deduce that of: x^2-y^2.

b) Encircle: x^2 , y^2 , $\frac{1}{x-2}$ then, $\frac{x^2+y^2}{x-2}$.

VIII- Compare without using calculator the real numbers:

☆ $r=7-\sqrt{3}$ *and* $n=3+\sqrt{2}$

IX- Let be $a \& b$ any two real numbers so that $0 < a < b$

a. Compare $\frac{2a-1}{a}$ *and* $\frac{2b-1}{b}$

b. Deduce the comparison of: $\frac{2955}{1978}$ *and* $\frac{2971}{1986}$

X- Let r be any real number so that, $-2 < r < -1$.

☆a. Prove that $0 < \frac{r+1}{r} < 1$.

b. Knowing that if n is a real number in the interval $[0;1]$, then $n^2 < n < \sqrt{n}$

☆ Deduce the comparison of $\sqrt{\frac{r+1}{r}}$ *and* $1+\frac{2}{r}+\frac{1}{r^2}$

XI- Given the three real numbers x, y and z, so that : $x \in [\,1;\ 2\,]$, $-3 \le y \le -1$ & $0 \le z \le 2$.

a) Frame the expression: $G = \frac{2y}{2x+5z}$.

b) Deduce the value of: $|G|$.

XII- Consider the numbers: $|x| \le 2 \& -4 < y < -2$

a. Encircle: $y-x, x^2 \& -\frac{1}{y}$

b. Deduce the simplification of: $D = \sqrt{(y-x)^2} + \left|\frac{1}{y}\right| - x$