Ordering properties

$a, b \in \mathbb{R}$: Either $a < b$, or $a = b$, or $a > b$.

$a \leq b \iff (a < b \text{ or } a = b)$

$a < b \iff a + c < b + c$.

$a < b \iff \begin{cases} ac < bc & \text{if } c > 0 \\ ac > bc & \text{if } c < 0. \end{cases}$

$a < b$ and $b < c \implies a < c$.

2.7331 and 2.733

$2.7331 = 2.733 + 0.0001 > 2.733$.

$\frac{1}{3}$ and $\frac{1}{6}$.

So $\frac{1}{3} > \frac{1}{6}$.

-5 and -6

$\iff$

$\iff$

-3 and $-3/2$

So $-3 < -3/2$.

$\sqrt{2}$ and 200

Then

Compare the given real numbers.

$\frac{1}{3} < \frac{1}{6} \iff \frac{1}{3} + \left(-\frac{1}{6}\right) < \frac{1}{6} + \left(-\frac{1}{6}\right)$.

$\iff \frac{1}{3} - \frac{1}{6} < 0$.

$\iff \frac{6-3}{18} < 0$ False.

$-5 + (-(-1)) = -5 + 6 = 1 > 0$.

$-5 + (-(-6)) + (-6) > 0 + (-6)$

$-5 > -6$. True.

$-3 < -\frac{3}{2} \iff (-2)(-3) > (-2)\left(-\frac{3}{2}\right)$

$\iff 6 > 3$ True

$\sqrt{2} < \sqrt{4} = 2$. and $2 < 200$

$\sqrt{2} < 200$.