Does this need to work for negative numbers?

No. But it would be trivial to do.

Should \((\text{egypt}/143)\) equal 4 or 4.66666666667?

In either case, we halve (integer division) the values in both columns a and b. We stop when column a becomes less than 1. At this point, the answer resides in column d.

If the number in column b is less than or equal to that of column c, we add column a to column d.

Therefore, the answer has to be an integer.