FACTS IN PROOFS. BESIDES DEFINITIONS WHICH ARE ADDED FROM TIME TO TIME, THERE ARE OTHER TYPES OF GENERAL STATEMENTS WHICH ARE PART OF OUR COMMON EXPERIENCE AND SO FUNDAMENTAL TO BE ACCEPTABLE WITHOUT PROOF. IF TWO OBJECTS ARE EQUAL AND WE ADD OR SUBTRACT EQUAL QUANTITIES, OR MULTIPLY BOTH BY THE SAME NUMBER, THE RESULTS IN EVERY CASE ARE ALSO EQUAL — THE BALANCE IS MAINTAINED. SUCH OBVIOUS RELATIONSHIPS WE CALL AXIOMS — STATEMENTS CONCERNING QUANTITIES IN GENERAL WHICH ARE ACCEPTED AS TRUE WITHOUT PROOF. "A QUANTITY MAY BE SUBSTITUTED FOR ITS EQUAL." "QUANTITIES WHICH ARE EQUAL TO THE SAME OR TO EQUAL QUANTITIES ARE EQUAL TO EACH OTHER." "THE WHOLE OF A QUANTITY IS EQUAL TO THE SUM OF ITS PARTS AND IS GREATER THAN ANY OF THEM." THERE IS ALSO A COMPLETE SET OF AXIOMS FOR INEQUALITIES. THESE ARE ILLUSTRATED IN THE FOLLOWING EXAMPLES:

ADDING	SUBTRACTING	MULTIPLYING	DIVIDING	ADDING
$5<7$	$8>4$	$3<7$	$8<4$	$3<5$
$2=2$	$2=2$	$2=2$	$2=2$	$2<4$
$7<9$	$6>2$	$10<14$	$4>2$	$5<9$

ADDING	SUBTRACTING
$6>4$	$5=5$
$3>2$	$3>1$
$9>6$	$2<3$

THESE EXAMPLES SHOW THAT IF EQUALS ARE ADDED OR SUBTRACTED FROM UNEQUALS OR IF UNEQUALS ARE MULTIPLIED OR DIVIDED BY THE SAME POSITIVE NUMBER, THE INEQUALITY IS MAINTAINED. IT IS ALSO EVIDENT THAT IF UNEQUALS OF THE SAME ORDER ARE ADDED TOGETHER, THE RESULTS HAVE THE SAME ORDER OF INEQUALITY, WHILE IF UNEQUALS ARE SUBTRACTED FROM EQUALS, THE ORDER OF INEQUALITY IS REVERSED. IF $A>B$ AND $B>C$, THEN $A>C$.

42. WORKING HYPOTHESIS, POSTULATES.

IN ADDITION TO AXIOMS WHICH ARE SELF-EVIDENT RELATIONS BETWEEN QUANTITIES IN GENERAL, WE STATE CERTAIN FUNDAMENTAL ASSUMPTIONS WHICH ARE ACCEPTED WITHOUT PROOF. THEY MIGHT BE CALLED OUR WORKING HYPOTHESES. THERE ARE GENERAL RELATIONS CONCERNING GEOMETRIC QUANTITIES WHICH ARE ASSUMED TO BE TRUE WITHOUT PROOF IN GEOMETRY. THE INTERSECTION

p46

p47

05/12/2018

2020/10/17