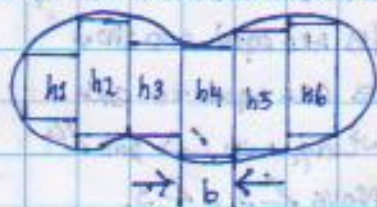


SIMPLE FIGURES SUCH AS TRIANGLES OR RECTANGLES, SO THAT FORMULAE FOR THESE SURFACES TO COVER THE SUBJECT OF AREA. THE FORMULA FOR THE AREA OF THE RECTANGLE: $\text{base} \times \text{height}$, or symbols, $A = bh$. SINCE TWO RIGHT TRIANGLES ARE PRODUCED BY DRAWING A DIAGONAL OF THE RECTANGLE, EACH IS THE HALF OF AREA AND SO, AS A FORMULA FOR THE AREA OF A RIGHT TRIANGLE: $A = \frac{1}{2}bh$. ANY REGULAR POLYGON IS COMPOSED OF TWICE AS MANY EQUAL RIGHT TRIANGLES AS IT HAS SIDES. HENCE ITS AREA IS GIVEN BY THE FORMULA $A = \frac{1}{2}bp$ WHERE h IS THE RADIUS OF THE INSCRIBED CIRCLE AND p IS THE PERIMETER.



IT IS INTERESTING TO CONSIDER THE PROBLEM OF FINDING THE AREA OF AN IRREGULAR PLANE FIGURE

BOUNDED BY A CONTINUOUS CURVE. A CLOSE APPROXIMATION TO THE AREA CAN BE MADE BY ASSUMING THE SMALL SECTIONS TO BE RECTANGLES. THEN THE AREA OF EACH RECTANGLE IS b TIMES ITS HEIGHT, AND THE TOTAL OF ALL THESE AREAS IS:

$$b(h_1 + h_2 + h_3 + h_4 + \dots + h_n)$$

THE SMALLER b IS TAKEN, THE CLOSER ~~TO THE~~ ^{SUM} OF THE AREAS OF THE RECTANGLES APPROACHES THE ACTUAL AREA. THIS IS ESSENTIALLY THE METHOD OF THE INTEGRAL CALCULUS WHICH CONSIDERS THIS SUM AS b APPROACHES ZERO. IN GEOMETRY, WE USE THIS DEVICE TO DETERMINE THE AREA OF A CIRCLE. IT CAN BE SHOWN THAT WHEN THE CIRCUMFERENCE OF ANY CIRCLE IS DIVIDED BY ITS DIAMETER, THE RESULT IS ALWAYS THE SAME. THE GREEKS DESIGNATED THIS CONSTANT BY THE LETTER π , AND IT HAS AN APPROXIMATE VALUE OF 3.1416. SINCE THIS IS SO, THE FORMULA FOR THE CIRCUMFERENCE OF A CIRCLE IS $C = \pi d$ IN TERMS OF DIAMETER OR, $C = 2\pi r$ IN TERMS OF THE RADIUS.

IF WE CONTINUE TO INCREASE THE NUMBER OF SIDES OF A REGULAR INSCRIBED POLYGON, IT WILL APPROACH THE CIRCLE IN SIZE AND SHAPE. THE AREA OF THE CIRCLE WILL BE APPROXIMATED



BY THE PERPENDICULAR FROM THE CENTER OF THE CIRCLE TO ANY SIDE OF THE POLYGON. NOW THE AREA OF A REGULAR POLYGON IS $\frac{1}{2} \times h \times p$ WHERE h IS THE PERPENDICULAR AND p IS THE PERIMETER (THE SUM OF SIDES) OF THE POLYGON, AND THE PERIMETER (CIRCUMFERENCE) OF A CIRCLE IS $2\pi r$. HENCE THE AREA OF A CIRCLE IS $\frac{1}{2} \times h \times 2\pi r$ OR