EXAMPLE.

$$1+2+4+5+7+8+27+53+104+204 = 415.$$

By formula

$$(403+5*204+4*104+3*53+2*27+8+4+6+8+5-8)/5 = 415.$$

CONCLUSION

Finite differences have wide application in formula development. There are, of course, many situations in which the use of this method leads to difficulties which other procedures can obviate. But where applicable the results are often obtained with such facility that other procedures seem laborious by comparison.

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A GOLDEN DOUBLE CROSTIC

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Use the definitions in the clue story which follows to write the words to which they refer; then enter the appropriate letters in the diagram to complete a quotation from a mathematician whose name appears in the last line of the diagram. The name of the book in which this quotation appeared and the author's last name appear as the first letters of the clue words. The end of each word is indicated by a shaded square following it.

CLUE STORY

The mystic Golden Section Ratio, $(1+\sqrt{5})/2$, called __(A-1, A-2)__ (the latter most commonly), occurs in several propositions in __(A-3, A-4)__ on line segments and __(A-5)__. This Golden Cut fascinated the ancient Greeks, particularly the __(D-1)__, who found this value in the ratio of lengths of segments in the __(D-2)__ and __(D-3)__ and who also made studies in __(D-4)__. The Greeks found the proportions of the Golden Rectangle most pleasing to the eye as evidenced by the ubiquitous occurrence of this form in art and architecture, such as __(C-1)__ or in sculpture as in the proportions of the famous __(C-2)__; however, they may have been copying __(C-3)__, for the Golden Proportion occurs frequently in the forms of living things and is closely related to the growth patterns of plants, as __(C-4, C-5, C-6)__, in which occur ratios of Fibonacci numbers. The Golden Section is the limiting value of the ratio of two successive Fibonacci numbers (named for __(G-1)__), being closely approximated by the __(G-2, G-3)__.

By some mathematicians, the beauty of the __(N)__ relating to the Golden Section is compared to the theorem of the __(D-1)__ and to such results from projective geometry as those seen in Pascal's "Mystic __(B)__" or even in the applications of mathematics in the *Principia Mathematica* of __(I)__ while the constant $(1+\sqrt{5})/2$ itself is rivalled by __(E-1)__ and __(E-2)__.

Unfortunately, not all persons find mathematics beautiful. __(H-1)__ was one of the four branches of arithmetic given by the Mock Turtle in *Alice in Wonderland,* and the card player's description of the sequence 2, 1, 3, 4, 7, ______, 18, 29, 47, ⋯ would be __(H-2)__, while some have to have all mathematics of practical use, such as in reading an __(M)__.

[The solution appears on page 83 of the *Quarterly.*)

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A-1: 6 10 25 40 89 127 177 176 35 153

B: 9 27 87 116 51 100 116 128

A-3: 66 25 146 177 109 140 167

D-2: 149 14 149 22 118 77 57 171 149 7 59 30

C-1: 164 148 84 38 5 160 23 133 60 65 81 148 75 83

C-2: 69 124 148 166 111 67 164 43 164 172 138

E-1: 32

C-3: 148 93 102 166 16 58

A-4: 107 177 17 115 143 155 88 167

D-1: 46 117 19 49 77 1 14 7 169 77 30 33

G-2: 110 159 141 82 147 104 136

M: 135 61 157 96 36 12 2 21

D-3: 46 175 30 105 77 1 7 77 91

A-2: 40 89 176 35 68

A-5: 63 31 146 20 122 80 15 177 129 55

N: 125 142 158 119 53 90 152 144

C-4: 164 148 111 166 148 108 172 44 13 92 123 111 160 72 41 98 172 71

C-5: 138 133 164 148 67 23 164 28 164 178 111 138 133 164 148

I: 94 39 150 34 29 94 24 76 54 120 62

D-4: 49 77 179 91 14 30 154

H-1: 132 137 139 70 45 103 163 18 112 79 85 74

H-2: 74 165 173 50 163 174

G-3: 56 170 162 99 48 8 52 99 114 141 126 37 106 82 26 64 145 134 99

G-1: 78 151 3 99 101 161 95 147 121 82 131 156 99 147

E-2: 86

C-6: 47 97 172 172 73 113 168 130 11 4 164 148 42

					1 D	2 M	3 G	4 C	5 C	6 A	7 D	8 G			9 B	10A	11 C			
12M	13 C	14 D		15 A	16 C	17A	18H	19D		20A	21 M	22 D	23C	24 I	25 A	26G	27B	28C		
			29 I	30 D	31 A		32 E	33D		34 I	35A	36 M		37 G	38C	39I	40 A	41 C	42C	43C
		44C	45H		46D	47C	48G	49D	50H	51B	52G	53N	54I	55 A			56G	57D	58C	
	59 D	60 C	61M	62 I	63A		64G	65C	66 A			67C	68A	69C	70H	71C	72C	73C	74 H	
	75 C	76 I		77 D		78 G	79H	80A	81 C		82G	83 C	84 C	85H		86E	87 B	88A	89 A	90N
91D	92C		93C	94I	95G			96M	97C	98C	99G				100B	101G	102C	103H	104G	
	105D	106G	107A		108C	109A	110G	111C	112H			113C	114G			115A	116B	117D		
	118D	119N	120I	121G	122A	123C	124C		125N	126G		127A		128B	129A	130C	131G	132H	133C	134G
		135M	136G		137H	138C	139H	140A		141G	142N	143A			144N	145G	146A	147G	148C	149D
			150I	151G		152N	153A	154D			155A	156G	157M	158N			159G			
					160C	161G	162G	163H	164C	165H	166C	167A				168C	169D	170G	171D	172C
								173H		174H	175D	176A	177A	178C	179D					