ANSWERS

A) _____ D) (___ , ___ , ___ , ___ , ___ , ___)

B) (__ , __) $S = \{$ _____ $\}$ E) _____

C) (_____ , _____ , _____)   F) _____

A) Given: $\sum_{n=1}^{n=32} (1+i)^n = k(1-i)$ Compute k.

B) There are K possible digit-sums for the set of 2-digit primes.
Let S be the set of the most frequently occurring digit-sums and N be the number of times each of these sums occurred.
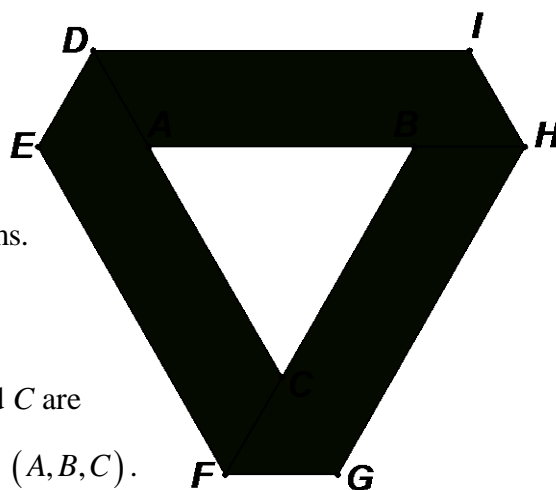Determine the ordered pair (K, N) and the set S.
Recall: The digit-sum of a number is the sum of the digits in that number.

C) ABC is an equilateral triangle with area 1 unit^2.
$DEFC$, $FGHB$ and $HIDA$ are congruent parallelograms.
If $FG = \dfrac{1}{2}$, the area of the shaded region can be

expressed in the form $\dfrac{A\left(\sqrt{3} + B\sqrt[4]{3}\right)}{C}$, where A, B and C are

relatively prime integers. Compute the ordered triple (A, B, C).

D) $36x^2 - 3xy - 60y^2 + 18x + 38y - 4$ factors as the product of two trinomials,
namely $Ax + By + C$ and $Dx + Ey + F$, where each constant is an integer.
If $AB < 0$, compute the ordered 6-tuple of constants (A, B, C, D, E, F).

E) Compute $\sin 10° \sin 30° \sin 50° \sin 70°$.

F) The exterior angles (one at each vertex) of $\triangle ABC$ measure
$(2(x+y)+8)°, (5y-x)°$ and $(3x+y-44)°$, where x and y are integers.
$x + y > 41$ and $2y - x > 46$
The obtuse angle formed by the bisectors of the acute interior angles of $\triangle ABC$ measures $146°$.
Compute the degree-measure of the <u>largest</u> <u>exterior</u> angle of $\triangle ABC$.