Hedgehog, Muskox, Newt, Koi ?   **APEX DX - Recreational Mathematics**

Mathematical Certainties: **APEX DX**

1) Products and powers of odd numbers are odd and even numbers are even.
2) Square numbers never end in the digits 2, 3, 7 or 8.
3) Three consecutive cubes must add to a multiple of 9.

The joy of pencil and paper solving.   **LIONEL**

The *Cm* cipher titles and accompanying cribs provide extensive openings to employ the computer research tools at our disposal to unveil vast stores of input and knowledge of the world around us while working on the solving process to uncover cipher plaintext, expanding our educational process is at our doorstep. Two such constructions follow:

MJ 2021 E-23. Trifid. Avian condos? (Ends: birdhouse) RIG R. MORTIS

Knowledge continues to abound as pencil and paper solving investigation leads us into discovering insight into the world around us. This time, the title, Avian Condos and crib (birdhouse) leads us to a Google expensive bird house in Lincoln, California and the Thunder Valley Casino Cliff Swallow construction, a bird house look-a-like pagoda, built to protect casino buildings from swallow bird infestation and provide an elegant, expensive home for the barn swallows. Google goes on to provide us much plaintext for this Trifid construction as we follow its narrative.

SO. 2020 E-16. Vigenere. Punic expansion. (LABRONICUS) (Period Thirteen) Title, crib and beginning plaintext with common trigraph open the door to Punic Wars and the interest in Carthaginian precious metals, with much plaintext to fill.

The Tyro Tutorial

This is available at our ACA web site under Resources. It describes the solution process to some thirty different cipher types and includes a Railfence Template, Polyomino Congruent Squares by APEX DX, a comprehensive listing of Null Variables by BION, Foursquare Cipher digraph frequencies by RISHU, the use of Google as a solving tool and Affine & Hill cipher types to stimulate and interest young minds in the mathematical process.

Free Code and Cipher Books – Place an order. The mailing is also free.

Alvin's Secret Code – Hicks   *Baconian Cipher* – Gallup   *Codes & Ciphers* – Ashton
Cryptographic ABC's – B. NATURAL   *Games to* Go – Gladstone   *Harry Potter, Art of Spying* - Boughey
Practical Cryptanalysis – Bowers   *Secret Codes and Messages* – Beal *Spy in Old Philadelphia* - Emery

ZANAC's Gimme a Break – SO Aristocrats (may be digraphs / trigraphs)
A-1, that, A-2, the (4), A-3, the (2), A-4, the (3), A-5, ion (2), A-6, the (2), A-7, the (2), A-8, ing (3), A-9, the (4),
A-10, the (2), A-11, the, A-12, Turkey, A-13, the (3), A-14, the (3), A-15, ing (3), A-16, the (2), A-17, ing (3),
A-18, and (2), A-19, the, A-20, that, A-21, you (3), A-22, the (2), A-23, the, A-24, ing (4), A-25, Prying

ZANAC's Gimme a Break - SO Patristocrats (may be digraphs / trigraphs)
P-1, that, P-2, the (2), P-3, the (2), P-4, book, P-5, every (2), P-6, you (2), P-7, the (4), P-8, the (2), P-9, the (3)
P-10, VILZS = equal, P-11, some (2), P-12, you (4), P-Sp-1, ing (2), P-Sp-2, CFHURF = driver

JA. JA-1. Ornamental. Creatures. (-TXLW) **THE RAT**
A dash should have been included in the crib to indicate that its plaintext "imal" was part of the word "animal."
MSCREP: It's a Null with some unusual animal names of Hedgehog, Muskox, Newt and Koi.
JA. A-25. Unsportsmanlike conduct. K4. Plaintext begins "Gawky" **PELKABO**
JA. P-10. Odd bird. K2. (ZLIG) Odd bird is "Euphonia" **REGULUS**
JA. X-7. ???? K2. Famous Salon. Spanish. Begins "En el" **SHMOO**
JA. X-9. Dutch Incomplete Columnar. (je leeft) PARROT: Period Five, begins "Ik" **THE DOC**
JA. X-11. Spanish Keyphrase. Love letter. (English key) (escribo) Begins "Mama" **EL CONDOR**
JA. E-3. Portax. A paradox. (QIOFXMUPY) Period Eight. Begins "The" **BION**
JA. E-9. Nihilist Substitution. Age difference. (QYFF) MSCREP: Period 11. Crib ext: "I didn't believe" **DANEEL**
JA. E-10. Monome-Dinome. In the great outdoors. (NBLIOAB) Begins "You can't" **ICE CAP**
JA. E-11. Foursquare. Abandoned workers. MSCREP: Crib extension "donkeys" Begins, "Bonaire" **SHMOO**
JA. E-16. Phillips. Decisions, decisions. (aga insta seaof) Google crib for start. **WORD WIZARD**
JA. E-18. Two-Square. Yet more retail horror? (fyprofileafewyea) **TSIOLKOVSKY**
PARROT: Begins "Supermarket chain"
JA. E-19. Tridigital. Loyal most of the time. MSCREP: Crib extension, "guard your house" **ICECAP**
JA. E-21. Playfair. Worryingly silly. PARROT: Begins "Moore's Law" **TSIOLKOVSKY**
JA. E-22. Gromark. Don't get caught in this racket. **DARING FLAIR**
MSCREP: Crib extension: "Charles VIII of France"
JA. C-5. Additions. (Two words, 1-0) O = 3, N = 6, W = 8 **ACHAMP**
JA. C-7. Division. (Two words, 1-0) 1st word begins with "C." 2nd word, three letters, begins with "P." **LIONEL**
JA. C-14. Multiplication. (No word, 0-9) D = 0, L = 4, U = 7 **FOMALHAUT**
JA. C-Sp-1. Duodecimal Division. (Three words, 1-0) A = 4, C – 7, R – A **LI'L GAMIN**
JA. AC-1322. Quagmire III. Two formative books.
MSCREP: Crib extension: "a childish fantasy that often" **SHMOO**
SO-1. Aristocrat. Get bleary eyed assigning ciphertext letters to Ornamental Icons. Steve Jobs quotation. **SILCO**
Second Icon = space.
SO. A-24. Distinction. K3. Second plaintext word used when comparing. **BARK**
SO. P-11. Representative. K3. (QBYH) (things – 2) **SERPENT SYRE**
SO. E-1. Complete Columnar. Which? (UHX) Ciphertext posted in six vertical columns. **CONFUOCO**
SO. E-2. Route Transposition. Burma Shave Road Sign. (pushing) Reverse horizontal route. **LIONEL**
SO. E-3. Gronsfeld. Life learning. (the fine) Period Eight, begins "Do" **OOBOO**
SO. E-6. Porta. It wasn't that difficult. (the-2) PARROT: Period Six. Begins "I d-" **ICECAP**
SO. E-8. Tridigital. Hopeful sign? (ship is) Digit 5 is separator. Crib placed at digits 9 4 8 1 and 8 9. **PELKABO**
SO. E-9. Swagman. Flying spy. (inscribed with a code.) Period Six. Pakistani pigeon. **THE DOC**
SO. E-10. Nihilist Transposition. Discolored. (UJJFY) Vertical ciphertext posting. **DOPPELSCHACH**
SO. E-11. Ragbaby. Misidentified meal. (WUHHCVUFCMNCW) Begins "Coel-" **SHMOO**
SO. E-14. Bifid. Thought from retiring amateur. (Ends: cryptanalytic skills) **APPLE JACK**
SO. E-15. Quagmire II. Giant mausoleum. Period Nine. Crib at position 75. Begins "John" **SHMOO**
SO. E-16. Vigenere. A mystery. (amount) Period ten, begins with common three letter trigraph. **BION**
SO. E-18. Bazeries. Joy. (railroad) Begins with "Joy;" First key digit, "3." **LIONEL**
SO. E-19. Key Phrase. Only once. (Bond-2) James Bond did this only once in his movies. **CEREDWYN**
SO. C-3. Sudoku. (Two words *, 4th column) Begins, "Som-" **DABASAP**
SO. C-4. Square Root. (One word, 9-0) Begins with the letter, P, ends with the letter, M. **LIONEL**
SO. C-13. Sudoku. (3 words, 5th row) Begins, "Two" **DOPEFISH**

Sunny Ciphering, LIONEL