

as,  $x=2^{p-1}$   $y=2^{p-2}$   $z=2^p-1$   $z^2=2^{2p}-2^{p+1}+1$   $z^2=MPS=PN+OC=4CR+1$   $PN=xz$   $PNS=x^2=CR+x$   $OC=yz$   $OCS=y^2$   $CR=xy=y^2=x^2-x$   $2y+1=y$ -next

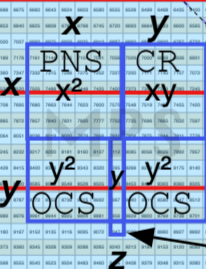
# The Exponential Power of 2 as it interferes with the MPS

1-3-7-15-31-63-127-255-511-1023-2047-4095-8191

## The Running Sum ( $\Sigma$ ) defines: The MPS-Mp-PN-OC-CR

$z^2 - 2(y^2) = z$ -next =  $xz + y = 2x^2 - 1$

$(2(x^2 + y^2) - 1)^{1/2} = z$   
 $(2(x^2 + y^2) - 1) = z^2 = x^2 + y^2 + 2xy$  =MPS  
 $x^2 + y^2 = (z^2 + 1)/2 = 2xy + 1$   
 $OCS + PNS = (z^2 + 1)/2 = 2CR + 1$

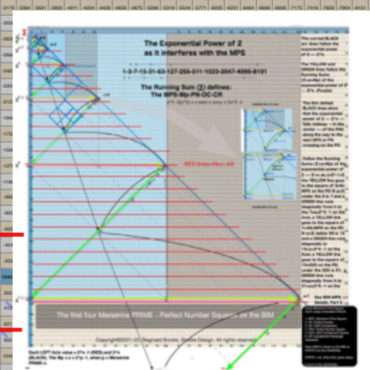
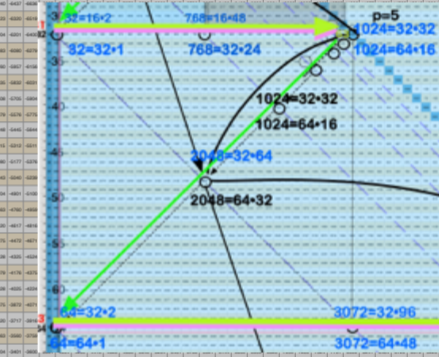
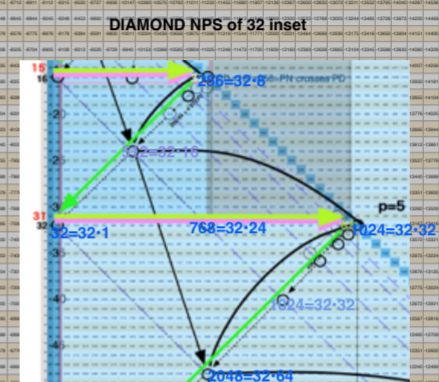


The curved BLACK arc lines follow the exponential power of 2 ---  $2^n$ .

The YELLOW and GREEN lines follow the Running Sums ( $\Sigma=z=2^p$ ) of the exponential power of 2 ---  $2^n$ . (Purple)

The thin dotted BLACK lines show that the exponential power of 2 ---  $2^n$  --- falls midway ---in the center --- of the PNS along the way to the next MPS or PN crossing on the PD.

Follow the Running Sums ( $\Sigma=z=2^p$ ) of the exponential power of 2 ---  $2^n=x$  as  $z=2^2-1=3$  the YELLOW line goes to the square of  $3=9$ =MPS on the PD @  $p=2$ ; under the 9 is 7 and a GREEN line runs diagonally from it to the  $7=z=2^3-1$  on the Axis; a YELLOW line goes to the square of  $7=49$ =MPS on the PD @  $p=3$ ; below 49 is 15 and a GREEN line runs diagonally to  $15=z=2^4-1$  on the Axis; a YELLOW line goes to the square of  $15=225$  on the PD; under the 225 is 31; a GREEN line runs diagonally from it to  $31=z=2^5-1$  on the



RED LINES = NON-AR

BLUE LINES = AR

The first four Mersenne PRIME - Perfect Number Squares on the BIM

$p=7$  See BIM-MPS: 127 Details, Part II.

- Every Mersenne Prime Square has 6 unique embedded AREAS:
1. MPS: Mersenne Prime Square
  2. PN: Perfect Number
  3. OC: ODD Complement
  4. PNS: Perfect Number Square
  5. OCS: ODD Complement Square
  6. CR: Complement Rectangle (repeated)
- Each AREA is shown on the BIM as STEPS from the DIAGONAL.  
 STEPS =  $x/4$ , while  $x/2 \cdot \Sigma$  gives values.  
 $\Sigma$ =sum of the coordinates.

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Each LEFT Axis value =  $2^n - 1$  (RED) and  $2^n$  (BLACK). The  $M_p = z = 2^{p+1} - 1$ , when  $p$  = Mersenne PRIME  $n$ .

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