BBS-ISL Matrix

To find the Row/Column placement of any Inner Grid (IG) number (#):
**STEPS:**

1. find Factors
2. add Factors, divide by 2 = Row #
3. confirm by determining Col #
   - a. divide IG # by larger Factor (or simply take the smaller Factor)
   - b. subtract the resulting quotient from the Row # = Col #
   - c. verify by finding the $\Delta$ between the two PD #s
Ex: 33 (Two Factor Sets, example for Factor Set: 3,11 only*)

1. Factors: 3, 11 — (1,33)
2. Row: 3 + 11 = 14, 14 ÷ 2 = 7 = Row 7
3. Column - confirm & verify:
   ○ a. Divide: 33 ÷ 11 = 3
   ○ b. Subtract: 7 - 3 = 4 = Col 4
   ○ c. verify: \(7^2 - 4^2 = 49 - 16 = 33\)

Therefore: IG# 33 appears 2 times on the IG at:

- Row 7, Col 4
- Row 17, Col 16 (* see note @ bottom)
Ex: 96 (Five Factor Sets, example for four Factor Sets only)

1. Factors: 2,48—3,32—4,24—8,12—(1,96)

2. Row:
   - 2 + 48 = 50, 50 ÷ 2 = 25 = Row 25
   - 3 + 32 = 35, 35 ÷ 2 = 17.5 = Row XXXX (Is NOT whole integer #)
   - 4 + 24 = 28, 28 ÷ 2 = 14 = Row 14
   - 8 + 12 = 20, 20 ÷ 2 = 10 = Row 10

3. Column - confirm & verify:
   - a. Divide:
     - 96 ÷ 48 = 2
     - xxx skip because not whole integer #
     - 96 ÷ 24 = 4
     - 96 ÷ 12 = 8
   - b. Subtract:
     - 25 - 2 = 23 = Col 23
     - xxx
     - 14 - 4 = 10 = Col 10
     - 10 - 8 = 2 = Col 2
   - c. verify:
     - 25² - 23² = 625 - 529 = 96
     - xxx
     - 14² - 10² = 196 - 100 = 96
     - 10² - 2² = 100 - 4 = 96

Therefore: IG# 96 appears 4 times on the IG. The three examples at:

- Row 25, Col 23
- Row/Col XXX (skip because not whole integer #)
- Row 14, Col 10
- Row 10, Col 2
- (*see note @ bottom re: 1,96)
SIMPLIFICATION

SIMPLIFICATION:

1. $\sum$ Factors $\div 2 = \text{Row #}$
2. Row # - Factor # = Col #
3. verify PD - PD = IG #
Ex: 96 (Factors: 1,96—2,48—3,32—4,24—8,12)

Factors: 2,48

1. \( \sum \) Factors \( \div 2 \) = Row #:
   o \((2 + 48) \div 2 = \) Row 25

2. Row # - Factor # = Col #:
   o 25 - 2 = Column 23

3. verify PD - PD = IG#:
   o \(25^2 - 23^2 = 625 - 529 = 96\)

Therefore: IG# 96 Appears on the IG at:

- Row 25, Col 23
Factors: 3,32

1. $\sum \text{Factors} \div 2 = \text{Row #}$:
   - xxx (no IG# with this Factor Set)
Factors: 4, 24

1. \[ \sum \text{Factors} \div 2 = \text{Row #} \]
   \[ (4 + 24) \div 2 = \text{Row 14} \]
2. \( \text{Row # - Factor # = Col #} \)
   \[ 14 - 4 = \text{Column 10} \]
3. verify \( PD - PD = IG# \)
   \[ 14^2 - 10^2 = 196 - 100 = 96 \]

Therefore: IG# 96 appears on the IG at:

- Row 14, Col 10
Factors: 8,12

1. \( \sum \text{Factors} \div 2 = \text{Row} \# \):
   \( (8 + 12) \div 2 = \text{Row} \ 10 \)
2. \( \text{Row} \# - \text{Factor} \# = \text{Col} \# \):
   \( 10 - 8 = \text{Column} \ 2 \)
3. verify PD - PD = IG\#:
   \( 10^2 - 2^2 = 100 - 4 = 96 \) on the IG at:
4. Row 10, Col 2
**Ex: 1125**

Factors: (1, 1125)

Factors: (3, 375)

Factors: (5, 225)

Factors: (9, 125)

Factors: (15, 75)

Factors: (25, 45)

1. $\sum \text{Factors} \div 2 = \text{Row #}$:
   - $(1 + 1125) \div 2 = \text{Row 563}$
   - $(3 + 375) \div 2 = \text{Row 189}$
   - $(5 + 225) \div 2 = \text{Row 115}$
   - $(9 + 125) \div 2 = \text{Row 67}$
   - $(15 + 75) \div 2 = \text{Row 45}$
   - $(25 + 45) \div 2 = \text{Row 35}$

2. Row # - Factor # = Col #:
   - Row 563 - 1 = Col 562
   - Row 189 - 3 = Col 186
   - Row 115 - 5 = Col 110
   - Row 67 - 9 = Col 58
   - Row 45 - 15 = Col 30
   - Row 35 - 25 = Col 10

3. verify by PD - PD = IG#:
   - $563^2 - 562^2 = 316,969 - 315,844 = 1125$
   - $189^2 - 186^2 = 35,721 - 34,596 = 1125$
   - $115^2 - 110^2 = 13,225 - 12,100 = 1125$
   - $67^2 - 58^2 = 4,489 - 3,364 = 1125$
   - $45^2 - 30^2 = 2,025 - 900 = 1125$
   - $35^2 - 10^2 = 1,225 - 100 = 1125$

**Therefore: IG# 1125 appears 6 times on the IG at:**

- Row 563, Col 562
- Row 189, Col 186
*The Factor Set that includes 1,X where X = the IG#, ALWAYS lies on the 1st Parallel Diagonal (3,5,7,...) if ODD; and if X=EVEN IG#, it will NOT be on the matrix grid, as 1+EVEN # = ODD #, e.i. IG# 33, using Factor Set 1,33, resolves to Row 17 Col 16, while IG# 8 does NOT have a Row/Col presence with Factor Set 1,8 as it does NOT resolve to a whole number.
FURTHUR INSIGHTS

In the Dickson Method for calculating ALL Pythagorean Triples (PTs), factors, as Paired Factor Sets \((s, t)\), come into play as:

- letting \(r=\text{EVEN } #\), such that \(r^2 = 2st\) is satisfied,
- gives \(a = r + s\), \(b = r + t\), and \(c = r + s + t\)
- and ALL PTs can be found.

In Exponentials, factors also come into play as Factor Sets \((s,t)\) — useful for finding the Axis Row and Column locations for any given exponential \(X^2\) value on the IG, where \(X = 1-2-3-\ldots\) and \(z = 1-2-3-\ldots\).

The SIMPLIFICATION method shown above is really:

- \((s + t) / 2^* = \text{Row } #\)
- \(\text{Row } # - s = \text{Col. } # = (t - s) / 2\)

Ex: 96 (Factors:4,24)

- \((s + t) / 2 = \text{Row } # = (4 + 24) / 2 = 14\)
- \((t - s) / 2 = \text{Col. } # = (24 - 4) / 2 = 10\)

Therefore: IG# 96 appears on the IG at:

- Row 14, Col 10

Furthermore, you can work back in REVERSE, if you know the IG exponential value,:

- divide \(t / s\), until it reaches the \(s\) value,
- add the # of divisions + 1 (for the \(s\) value itself), and
- the \(\sum\) will equal the exponential \(z\)-value of \(X\), where \(X = s\) value.

This ONLY works for Exponential IG #s.
Ex: 96 (Factors: 4, 24) Does not work — NOT an exponential

Ex: 32 (Factors: 2, 16)

- \(16 \div 2 = 8\)  \(\div 2 = 4\)  \(\div 2 = 2\)  \(\div 2 = 1\)  divisions = 5 = \(z\)
- \(X = s = 2\)
- \(X^2 = 2^5 = 32\)

Therefore: IG# 32 = \(2^5\)