UPSC CSAT Formula Gallery (Maths)

PDF Edition (SAMPLE)

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Basic Arithmetic

RULES OF DIVISION

- dividend = (divisor x quotient) + remainder
- divisor = (dividend - remainder) / quotient
- quotient = (dividend - remainder) / divisor
- remiander = dividend - (divisor x quotient)

SUM OF NUMBERS

In the below formula, (n) = last natural number in the series given.

$$\text{sum of first (n) natural numbers} = \frac{n(n+1)}{2}$$

$$\text{sum of multiplication table of x} = \frac{x \times n(n+1)}{2}$$

$$\text{sum of square of first (n) natural numbers} = \frac{n\,(n+1)\,(2n+1)}{6}$$

$$\text{sum of the cube of first (n) even natural numbers} = \left(\frac{n(n+1)}{2}\right)^2$$

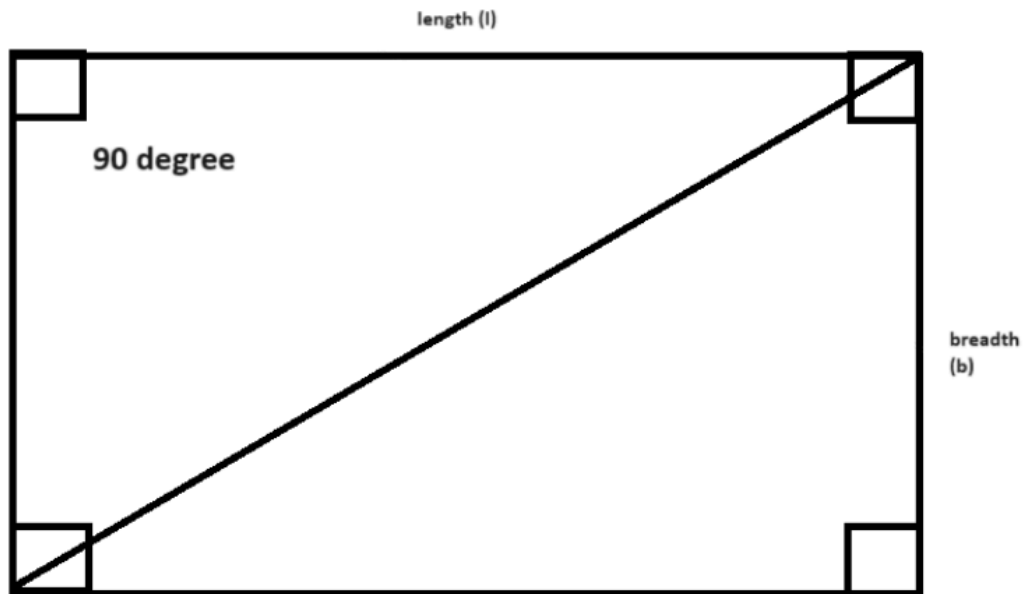$$\text{sum of the first (n) even natural numbers} = n(n+1)$$

$$\text{sum of the first (n) odd natural numbers} = \left(\frac{n+1}{2}\right)^2$$

Mensuration

Rectangle related formulae for CSAT

Rectangle: a rectangle is a plane whose opposite sides are equal and diagonals are equal. Each angle is equal to 90 degrees. [l = length; b = breadth]

length (l)

90 degree

breadth (b)

$$\text{Perimeter} = 2 \times (l + b)$$

$$\text{Area} = l \times b$$

$$\text{length} = \frac{area}{breadth}$$

$$\therefore length = \left(\frac{Perimeter}{2} - breadth \right)$$

$$\text{breadth} = \frac{area}{length}$$

$$\therefore breadth = \left(\frac{Perimeter}{2} - length \right)$$

$$\text{diagonal} = \sqrt{length^2 + breadth^2}$$