

## PAPER MATH FORMULAS

### To Calculate M-Weight

#### For less than 374 square inches

$$\frac{\text{Sheet Width} \times \text{Length} \times \text{Basis Weight}}{\text{Basis Size Width} \times \text{Length}} = \text{Ream Weight} \times 2 \text{ (round to 2 decimal places)} = \text{M-Weight}$$

#### For 374 square inches and greater

$$\frac{\text{Sheet Width} \times \text{Length} \times \text{Basis Weight}}{\text{Basis Size Width} \times \text{Length}} \times 2 \text{ (then round to nearest full pound)} = \text{M-Weight}$$

### To Calculate the Basis Weight For a Given Size and Weight of Paper

$$\frac{\text{Ream Weight} \times \text{Basis Size Width} \times \text{Length}}{\text{Paper Width} \times \text{Length}} = \text{Basis Weight}$$

### To Calculate the Weight of An Order

$$\frac{\# \text{ Sheets} \times \text{M-Weight}}{1000} = \text{Total Lbs.}$$

### To Calculate Pages Per Inch

$$\frac{2000}{\text{Caliper (pts)}} = \text{estimated pages per inch}$$

(To accurately predict, you need a compression factor included)

### To Calculate the Length of paper in a roll of known diameter and paper thickness

$$\text{Length of Paper} = \frac{f (\text{Dia}^2 - \text{Core}^2)}{\text{Caliper}}$$

$$f = \text{Factor: Metric } f = 78.54$$
$$\text{English } f = 65.45$$

## PAPER MATH FORMULAS

### To Calculate the Length of paper in a roll of known width and net weight (not including wrapping and core)

$$\text{Length Paper (English)} =$$
$$\text{Length (feet)} = \frac{(41.7 \text{ ft/in}) \times (\text{roll net wt, lbs}) \times (\text{nominal BW ream size, in}^2)}{(\text{nominal basis weight, lbs}) \times (\text{roll width, in})}$$

Where: "nominal BW ream size, in<sup>2</sup>" is 17x22=374 in<sup>2</sup> for bond & office grades, or 25x38=950 in<sup>2</sup> for offset & printing grades

$$\text{Length Paper (Metric)} = \frac{100,000 \times \text{RWe}}{\text{RWi} \times \text{BWe}}$$

RWi = Roll width in centimeters

RWe = Roll weight in kilograms

BWe = Basis weight in grams per square meter

### To Calculate the Approximate Weight of a roll with known diameter, core, basis weight and caliper

Weight is: (Dia<sup>2</sup> - Core<sup>2</sup>) x width x appropriate factor below

Paper	Factor For Roll Weights
Antique	.018
Bond	.021
Ledger	.023
Uncoated Offset Opaque	.022
Machine Finish	.026
Supercalendered	.028

## DECIMAL EQUIVALENTS OF ONE INCH

1/64 = .015625	17/64 = .265625	33/64 = .515625	49/64 = .765625
1/32 = .03125	9/32 = .28125	17/32 = .53125	25/32 = .78125
3/64 = .046875	19/64 = .296875	35/64 = .546875	51/64 = .796875
1/16 = .0625	5/16 = .3125	9/16 = .5625	13/16 = .8125
5/64 = .078125	21/64 = .328125	37/64 = .578125	53/64 = .828125
3/32 = .09375	11/32 = .34375	19/32 = .59375	27/32 = .84375
7/64 = .109375	23/64 = .359375	39/64 = .609375	55/64 = .859375
1/8 = .125	3/8 = .375	5/8 = .625	7/8 = .875
9/64 = .140625	25/64 = .390625	41/64 = .640625	57/64 = .890625
5/32 = .15625	13/32 = .40625	21/32 = .65625	29/32 = .90625
11/64 = .171875	27/64 = .421875	43/64 = .671875	59/64 = .921875
3/16 = .1875	7/16 = .4375	11/16 = .6875	15/16 = .9375
13/64 = .203125	29/64 = .453125	45/64 = .703125	61/64 = .953125
7/32 = .21875	15/32 = .46875	23/32 = .71875	31/32 = .96875
15/64 = .234375	31/64 = .484375	47/64 = .734375	63/64 = .984375
1/4 = .25	1/2 = .5	3/4 = .75	1 = 1

## PAPER SIZE CONVERSIONS

Inches	Millimeters (Rounded)	Weight/ Pounds	Grams/ Sq. Meters
8 <sup>9</sup> / <sub>32</sub>	210	9	34
8 <sup>1</sup> / <sub>2</sub>	216	10	38
10	254	12	45
10 <sup>1</sup> / <sub>2</sub>	267	13	49
11	279	15	56
11 <sup>11</sup> / <sub>16</sub>	297	16	60
13	330	18	68
14	356	20	75
17	432	24	90
17 <sup>1</sup> / <sub>2</sub>	445	28	105
19	483	32	120
20	508	36	135
22	559		
22 <sup>1</sup> / <sub>2</sub>	572	30	45
23	582	35	52
24	610	36	53
25	635	40	59
26	660	45	67
28	711	50	74
29	737	60	89
34	864	70	104
35	889	80	118
38	965	90	133
45	1143	100	148
		120	178

Writing Papers  
Sub 17 x 22  
(Factor 3.760)

Office/  
Book Papers  
Sub 25 x 38  
(Factor 1.480)

## PAPER WEIGHT CONVERSIONS

## METRIC CONVERSIONS

<b>LENGTH</b> To Find	Do This	Equivalents
Millimeters	Inches X 25.4	1 Inch = 25.44 Millimeters, 2.54 Centimeters, .0254 Meters
Meters	Feet X .3048	1 Foot = .3048 Meters
Inches	Millimeters X .0397	1 Millimeter = .03937 Inch
Inches	Centimeters X .3937	1 Centimeter = .3937 Inch
Inches	Meters X 39.37	1 Meter = 39.37 Inches, 3.2808 Feet
<b>AREA</b> To Find	Do This	Equivalents
Sq. Millimeters	Sq. Inches X 25.4	1 Sq. Inch = 6.452 Sq. Centimeters, .000645 Sq. Meters
Sq. Meters	Sq. Feet X .092903	1 Sq. Foot = .092903 Sq. Meters
Sq. Inches	Sq. Centimeters X .155	1 Sq. Centimeter = .155 Sq. Inch
Sq. Feet	Sq. Meters X 1.196	1 Sq. Meter = 1,550 Sq. Inches, 10.7639 Sq. Feet
<b>WEIGHT</b> To Find	Do This	Equivalents
Grams	Ounces X 28.3495	1 Ounce = Grams
Kilograms	Pounds X .453592	1 Pound = Kilograms
Ounces	Grams X .03527	1 Gram = .03527 Ounce, .0022046 Pound
Ounces	Kilograms X 35.27	1 Kilogram = 35.27 Ounces, 2.2046 Pounds, 1,000 Grams
Pounds	Kilograms X 2.205	1 Metric Ton = 1,000 Kilograms