

Math Cheat Sheet

Percentages

Percent of total: Calculate percentage of two numbers

$$percent = \frac{number}{total} * 100$$

Eg. Find the percent that 69/420 represents

$$percent = \frac{69}{420} * 100$$

$$percent = 0.16 * 100$$

$$percent = 16\%$$

Amount from percent: Calculate the amount of something given the percent

$$amount = total * 0.\%$$

Eg. If you make 8% commission at your sales job, how much commission do you make if you sold \$4213?

$$amount = \$4213 * 0.08\%$$

$$amount = \$337.04$$

Basic Statistics

Mean/Average of a set

$$\frac{(Total\ of\ numbers)}{amount\ of\ numbers}$$

E.g. 1,1,2,3,5,8,13

$$average = \frac{(1+1+2+3+5+8+13)}{7}$$

$$average = \frac{33}{7}$$

$$average = 4.7$$

Median of a set

The element in the **middle** of a set

E.g. 1,1,2,3,5,8,13

3 is the median as there are the same number of elements on each side

Mode of a set

The element that appears the most often

E.g. 1, 1, 2, 3, 5, 8, 13

1 is the mode since it's the only number that appears twice

Spatial Geometry

Areas of polygons (2D Shapes)

- Regular Quadrilaterals (Rectangles & Squares): $a = b * h$
- Parallelograms: $a = b * h$
- Triangles: $a = \frac{b * h}{2}$
- Circles: $a = \pi r^2$
 $\pi = 3.14$
- Trapezoids: $a = \left(\frac{b+t}{2}\right) * h$

Volumes of Things

- Cylinders & Regular Prisms
 $area(base) * h$
- Pyramids & Cones
 $\frac{area(base) * h}{3}$

Exponent multiplication/division

When multiplying or dividing exponents, you add or subtract the exponent levels.

- When multiplying, add the exponents
 $x^5 * x^3 = x^8$
- When dividing, subtract them
 $x^5 / x^3 = x^2$

F(irst)O(uter)I(nner)L(ast)

Used to multiply the contents of brackets with two items each

E.g. $(7x + 3y)(8x + 5y)$

1. First - The first elements in each set of brackets
 $(7x + 3y)(8x + 5y)$
 $56x^2$

2. Outer - The outermost elements when observed together

$$(7x + 3y)(8x + 5y)$$

$$35xy$$

3. Inner - The innermost elements when observed together

$$(7x + 3y)(8x + 5y)$$

$$24xy$$

4. Last - The last elements in each set of brackets

$$(7x + 3y)(8x + 5y)$$

$$15y^2$$

Then combine these elements together

$$56x^2 + (35xy + 24xy) + 15y^2$$

$$56x^2 + 59xy + 15y^2$$

Unit Conversion

When converting from 1D to 2D, you must divide/multiply twice.

Converting from square inches to square feet

$$144in^2 = 1ft^2$$

$$(144in^2 / 12in / ft) / 12 = 1ft^2$$

$$12/12 = 1ft^2$$

Probability

When calculating the number of outcomes when elements can't be reused, multiply the number of items in the set times itself -1

Eg. How many ways can the following set be arranged? {1,2,3,4}

$$combinations = 4 * 3 * 2 * 1 = 24$$

This is called a factorial and is represented by !

$$Eg. 4! = 4 * 3 * 2 * 1$$