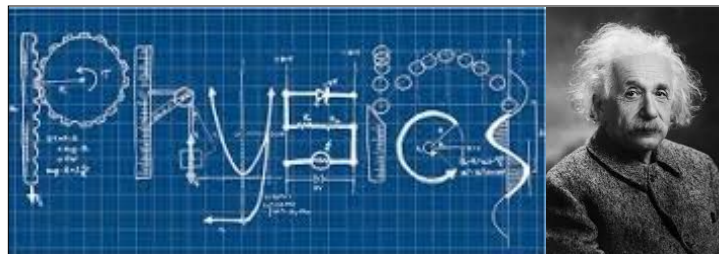
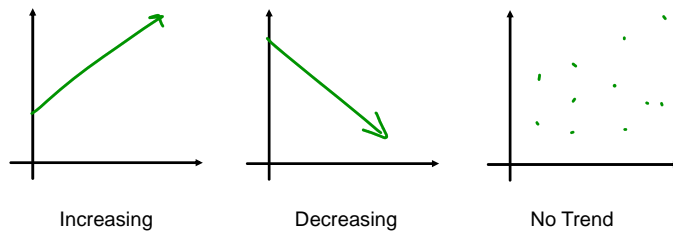


2.1 PreReq Skills

Graphing:

- Title: y vs. x graph (ie. Distance - Time Graph)
- Label axes: include units (remember, manipulated variable= independent variable, responding=dependent)
- Choose a Scale: you should use as much of the graph paper as possible for the most accurate graph

Ex.)



Metric Conversions:

"King Henry Drank My Dark Chocolate Milk"
 km m cm mm

Common Physics Units:

- length → metres
- time → seconds
- mass → kilograms

Time Conversions:

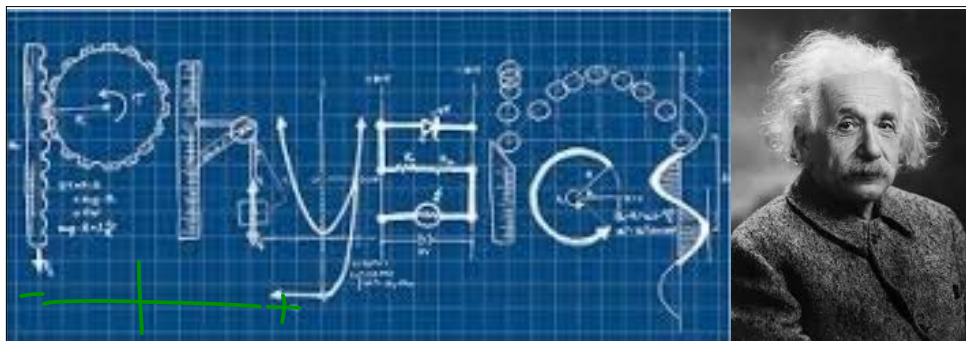
- 1 min = 60 s
- 1 hour = 60 min
- 1 day = 24 hours
- 1 year = 365.25 days (365 days)

362 km
 3620 m

Dimensional Analysis: ⇒ cancel units

How many seconds are in 4 days?

$$\frac{4 \cancel{\text{days}}}{1} \times \frac{24 \cancel{\text{h}}}{1 \cancel{\text{day}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{h}}} \times \frac{60 \text{ s}}{1 \cancel{\text{min}}} = 345600 \text{ s}$$



Scientific Notation:

$$4,500,000,000 = 4.5 \times 10^9$$

$$0.00003042 = 3.042 \times 10^{-5}$$

$$(3.8 \times 10^7)(5.4 \times 10^{10}) = 2.052 \times 10^{18}$$

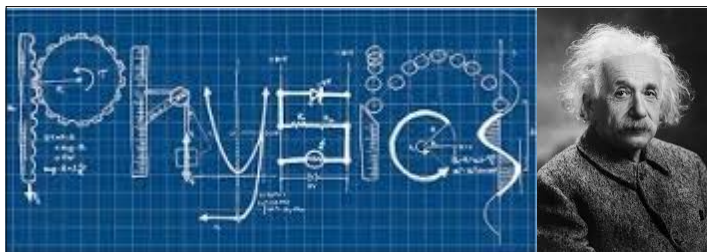
Calculator



Significant Digits/Figures:

Rules

1. All digits (1 - 9) before and after the decimal are significant.
2. Exact values or defined values are not significant. (Eg. 3 cats is an exact value so it is not considered to be 1 Sig Dig)
3. Zeros:
 - i. Leading Zeros are not significant
ie. 0.00365 has 3 Sig Dig
 - ii. Trailing zeros are significant
ie. 1400 has 4 Sig Digs
10.0 has 3 Sig Digs
 - iii. In between zeros are significant
ie. 103 has 3 Sig Digs
4005 has 4 Sig Digs



Significant Digits Continued:

Add/Subtract Rules

Your answer should contain the same number of digits after the decimal as the smallest number of digits after the decimal in the question.

Ex.) $5.4 - 3.24 = \underline{\quad ? \quad}$
1 2

Answer: 2.16

Since the question had, at least, 1 sd after the decimal, the answer must only have 1 sd after the decimal.

Correct Answer : 2.2

*** Multiply/Divide Rules ***

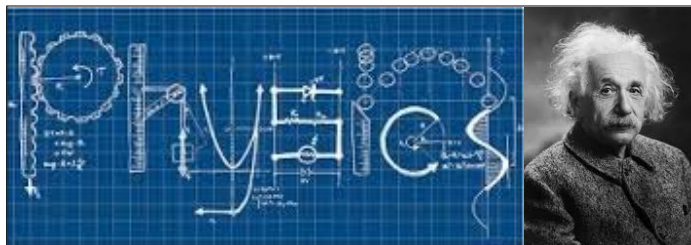
When multiplying or dividing, you must have the same number of sd in your final answer as the least number of sd in your question.

Ex.) $2.45 \div 1.432 = \underline{\quad ? \quad}$
3SD 4SD

Answer: 1.71089...

Since the question had a number with 3 Sig Digs and a number with 4 Sig Digs, we write our final answer with the lower number of Sig Digs, 3 Sig Digs.

Correct Answer : 1.71



Vectors vs. Scalars:

Scalar: no direction, only magnitude

Vector: magnitude and direction (an arrow is placed about vector quantities, ie. \vec{v})

\longrightarrow - vector arrow

Ex.) When driving in the Indy 500, drivers try to complete 200 laps of the course. If they finish the race, drivers will have driven 805 km (500 miles).

d Distance: 805 km

d Displacement: 0 km because drivers end up exactly where they started from

Ex.) A monkey walks 25 km East then walks 15 km West.

Distance: 40 km = $25\text{km} + 15\text{km}$

Displacement: 10 km East $25 - 15 = 10\text{ km East}$



positive vectors: North, East, right, up
negative vectors: South, West, left, down