

# Physics

Tools -

Scientific Units

Dimensions

Approximations

Sig Digs

Vectors

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Sig Digs

$$1 \text{ yr} = 365.24 \text{ days}$$

$$= 365.24 \text{ days} \cdot \frac{24 \text{ hours}}{1 \text{ day}}$$

$$= 365.24 \cdot 24 \text{ hours} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

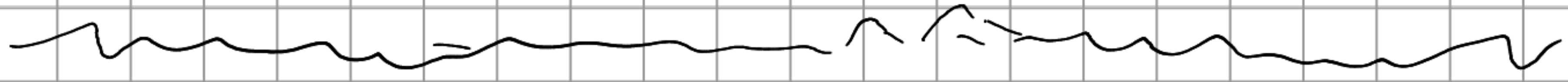
$$= 365.24 \cdot 24 \cdot 60 \text{ min} \cdot \frac{60 \text{ seconds}}{1 \text{ min}}$$

$$= \underline{31556736 \text{ seconds}}$$

1 year

$$= 3 \times 10^6 \text{ seconds (1 significant)}$$

$$1^\circ = \pi \text{ cm} \cdot \frac{2.54 \text{ cm}}{1^\circ} = 48.26 \text{ cm}$$



$$R = 6.371 \times 10^6 \text{ m}$$

$$1^\circ = 1852 \text{ m}$$

$$\text{Circumference} = 360^\circ$$

What is the distance over  $1^\circ$ ?

$$6.371 \times 10^6 \text{ m} \cdot \frac{1}{1852 \text{ m}} \cdot \frac{1^\circ}{360^\circ}$$



## Vectors & Scalars

Vectors have magnitude and direction  
Scalars have only a magnitude (size)

$$\bigcirc \xrightarrow{5 \text{ m}} \bigcirc \text{ in 2 seconds}$$

$5 \text{ m}$  is a scalar, but stating

$5 \text{ m to the right}$  is a vector

$2.5 \text{ m/second}$  Velocity

Velocity - Speed w/ direction

Speed - displacement

## Frame of Reference

Stationary on the ground?  
Moving left @ 50 m/s?  
Moving right @ 250 m/s?

On the screen, frame of reference is generally  
(0,0) (x,y) on the screen

## Average Acceleration

Rate of change of velocity

$$\text{average acceleration} = \frac{\text{final velocity} - \text{initial velocity}}{\text{time elapsed}}$$

Let's solve a problem in code.

So, an object is  $x_0$  and accelerates to  $x_{100}$   
in 2 sec, how might we depict this?  
in CSS? transitions? keyframes?  
in JS?