Name: _____

PHYSICS
Unit Conversion Practice

Conversion of length/distances (metric system)

1 km = 1000 m There are 1000 meters in 1 kilometer.
1 m = 100 cm There are 100 centimeters in 1 meter.
1 m = 1000 mm There are 1000 millimeters in 1 meter

Conversion	Using conversion factor	Decimal place alternative
km → m	m = km x 1000 Multiply km by 1000	Move decimal to right by 3 places
m → km	km = m/1000 Divide m by 1000	Move decimal to left by 3 places
cm → m	m = cm/100 Divide cm by 100	Move decimal to left by 2 places
m → cm	cm = m x 100 Multiply m by 100	Move decimal to right by 2 places
mm → m	m = mm/1000 Divide mm by 1000	Move decimal to left by 3 places
m → mm	mm = m x 1000 Multiply m by 1000	Move decimal to right by 3 places

Examples

Convert 2.0 km to meters	$2.0\ \text{km} \times \frac{1000\ \text{m}}{1\ \text{km}} = 2{,}000\ \text{m}$
Convert 450 cm to meters	$450\ \text{cm} \times \frac{1\ \text{m}}{100\ \text{cm}} = 4.50\ \text{m}$
Convert 16 cm to meters	$16\ \text{cm} \times \frac{1\ \text{m}}{100\ \text{cm}} = 0.16\ \text{m}$
Convert 2920 m to km	$2920\ \text{m} \times \frac{1\ \text{km}}{1000\ \text{m}} = 2.920\ \text{km}$
Convert 0.72 m to cm	$0.72\ \text{m} \times \frac{100\ \text{cm}}{1\ \text{m}} = 72\ \text{cm}$

Convert from one distance unit to another distance unit

Convert 5.00 km to meters	
Convert 275 cm to meters	
Convert 1450 cm to meters	
Convert 10.33 km to meters	
Convert 4200 m to km	
Convert 165 cm to meters	

Conversion of mass units

1 kg = 1000 g There are 1000 grams in 1 kilogram

Conversion	Using conversion factor	Decimal place alternative
kg → g	g = kg x 1000 Multiply kg by 1000	Move decimal to right by 3 places
g → kg	kg = g/1000 Divide g by 1000	Move decimal to left by 3 places

Examples

Convert 0.25 kg to grams	$0.25\,\text{kg} \times \frac{1000\,\text{g}}{1\,\text{kg}} = 250\,\text{g}$
Convert 12,240 g to kg	$12{,}240\,\text{g} \times \frac{1\,\text{kg}}{1000\,\text{g}} = 12.24\,\text{kg}$

Convert from one mass unit to another mass unit

Convert 8600 g to kg	
Convert 16,340 g to kg	
Convert 2.33 kg to g	

Conversion of time units

1 hr = 60 min There are 60 minutes in 1 hour
1 hr = 3600 s There are 3600 seconds in 1 hour
1 min = 60 s There are 60 seconds in 1 minute

Conversion	Using conversion factor
hr → min	min = hr x 60 Multiply hr by 60
min → hr	hr = min/60 Divide hr by 60
hr → s	s = hr x 3600 Multiply hr by 3600
s → hr	hr = s/3600 Divide s by 3600
min → s	s = min x 60 Multiply min by 60
s → min	min = s/60 Divide s by 60

Examples

Convert 2.5 hr to min	$2.5\,\text{hr} \times \frac{60\,\text{min}}{1\,\text{hr}} = 150\,\text{min}$
Convert 1.25 hr to s	$1.25\,\text{g} \times \frac{3600\,\text{s}}{1\,\text{hr}} = 4500\,\text{s}$
Convert 3.0 min to s	$3.0\,\text{min} \times \frac{60\,\text{s}}{1\,\text{min}} = 180\,\text{s}$
Convert 400 s to min	$400\,\text{s} \times \frac{1\,\text{min}}{60\,\text{s}} = 6.67\,\text{min}$

Convert from one time unit to another time unit

Convert 6.00 min to seconds	
Convert 3.75 min to seconds	
Convert 2.5 hr to seconds	
Convert 5 hr to seconds	
Convert 3.00 hr to min	
Convert 1200 sec to min	

Calculating Averages

Average is the statistical center of a distribution. To calculate the average:

- Add all values of measurements together.
- Divide by the number of measurements.

$$\bar{x} = \frac{\Sigma x_i}{n} = \frac{x_1 + x_2 + x_3 ... + x_n}{n}$$

Examples

121, 143, 137, 138, 132 (n = 5)	$\bar{x} = \frac{\Sigma x_i}{n} = \frac{121+143+137+138+132}{5} = 134$
87, 98, 103, 77, 82, 85 (n = 6)	$\bar{x} = \frac{\Sigma x_i}{n} = \frac{87+98+103+77+82+85}{6} = 88.7$

Calculate the average of the number sets

10, 13, 15, 20 (n = 4)	
30, 40, 41, 48, 59, 62 (n = 6)	
40, 52, 76, 78, 81, 89, 94, 103 (n = 8)	
107, 122, 124, 135, 149, 151, 153, 168 (n = 8)	