

Skills	Prefixes
2016-17	

In Physics we have to deal with quantities from the very large to the very small. A prefix is something that goes in front of a unit and acts as a multiplier. This sheet will give you practice at converting figures between prefixes.

Symbol	Name	What it means		How to convert	
P	peta	10^{15}	1000000000000000		↓ x1000
T	tera	10^{12}	1000000000000	↑ ÷ 1000	↓ x1000
G	giga	10^9	1000000000	↑ ÷ 1000	↓ x1000
M	mega	10^6	1000000	↑ ÷ 1000	↓ x1000
k	kilo	10^3	1000	↑ ÷ 1000	↓ x1000
			1	↑ ÷ 1000	↓ x1000
m	milli	10^{-3}	0.001	↑ ÷ 1000	↓ x1000
μ	micro	10^{-6}	0.000001	↑ ÷ 1000	↓ x1000
n	nano	10^{-9}	0.000000001	↑ ÷ 1000	↓ x1000
p	pico	10^{-12}	0.000000000001	↑ ÷ 1000	↓ x1000
f	femto	10^{-15}	0.000000000000001	↑ ÷ 1000	

Convert the figures into the prefixes required.

s	ms	μs	ns	ps
134.6				
96.21				
0.773				

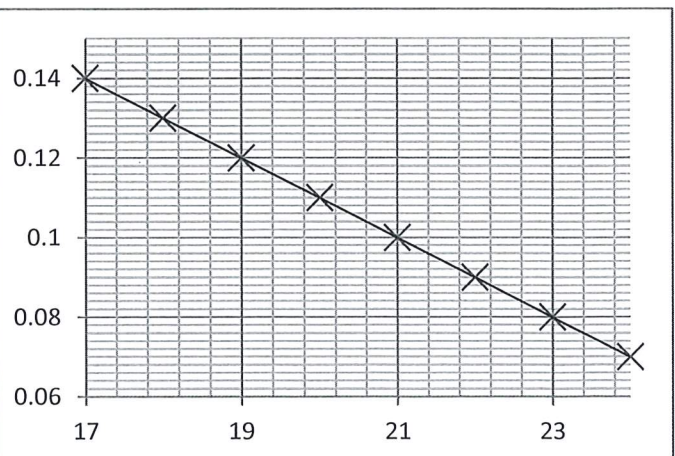
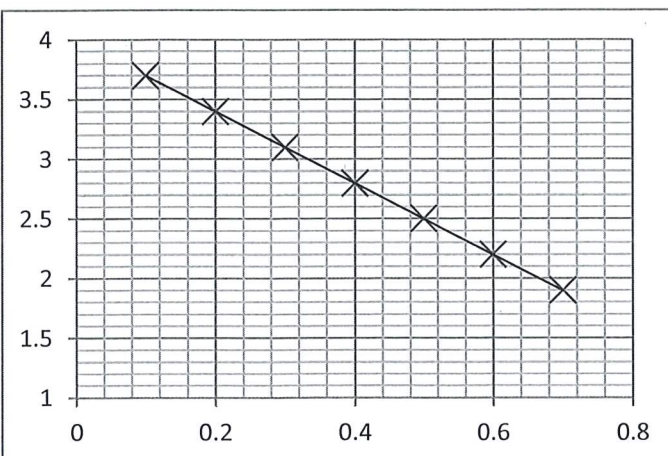
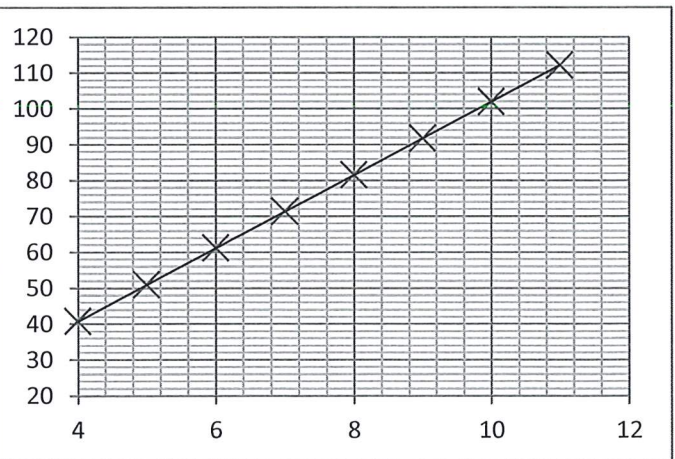
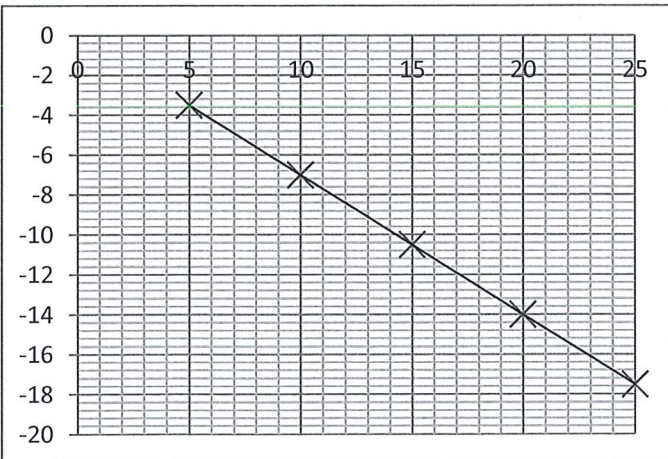
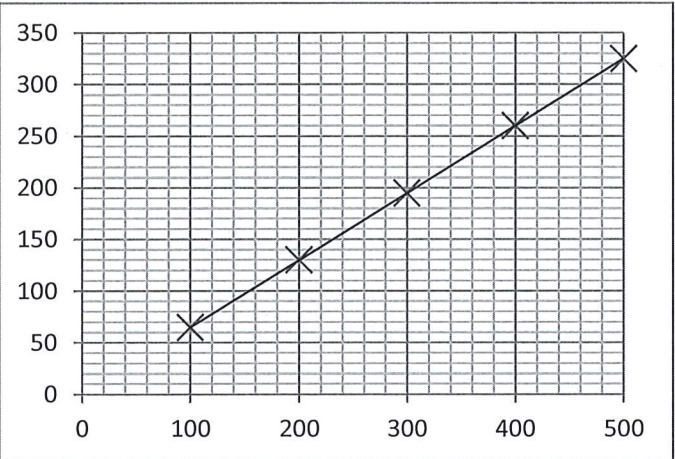
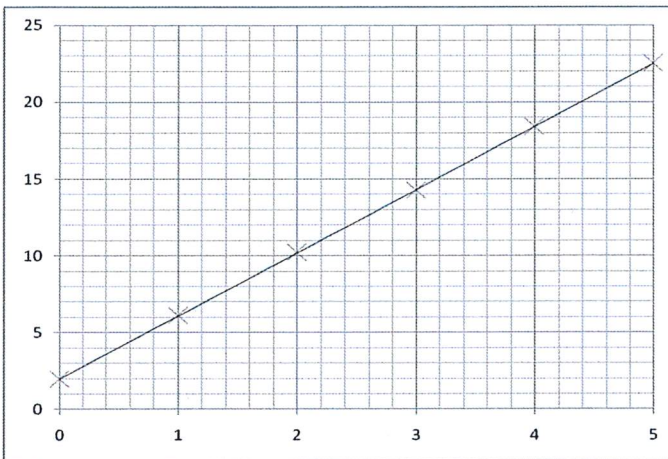
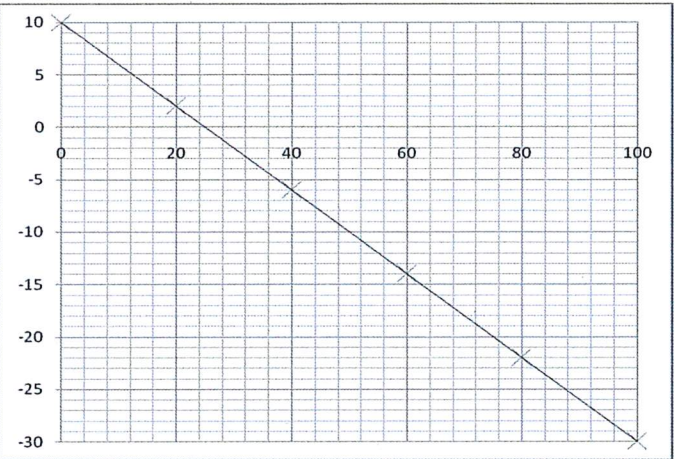
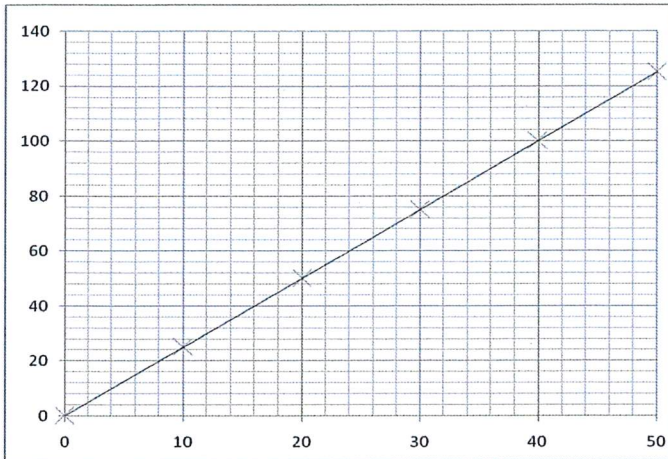
m	km	mm	Mm	Gm
12873				
0.295				
57.23				

kg	Mg	mg	g	Gg
94.76				
0.000765				
823.46				

A	mA	μA	nA	kA
0.000000678				
3.56				
0.00092				

Gradients

Calculate the gradients of the graphs below. Work out the equation for the line.



Gradient Equations

Complete the table below about graphs and gradients

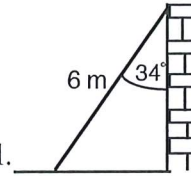
Equation	Graph	Rearrange Equation	Gradient	Intercept
$y = mx + c$	y plotted on the y axis	$y = mx + c$	m	c
	x plotted on the x axis			
$V = IR$	y axis = V	$V = RI$	R	0
	x axis = I			
$I = \frac{Q}{t}$	y axis = t			
	x axis = Q			
$\rho = \frac{RA}{l}$	y axis = l			
	x axis = R			
$\varepsilon = V + Ir$	y axis = V			
	x axis = I			
$E = VIt$	y axis = E/t			
	x axis = V			
$hf = \phi + E_K$	y axis = E_K			
	x axis = f			
$\lambda = \frac{h}{mv}$	y axis = $1/v$			
	x axis = m			
$E_p = mgh$	y axis = mg			
	x axis = E_p			
$E = \frac{1}{2} Fe$	y axis = e			
	x axis = $1/F$			
$c = f\lambda$	y axis = $1/\lambda$			
	x axis = f			
$v = u + at$	y axis = a			
	x axis = $1/t$			
$v^2 = u^2 + 2as$	y axis = v^2			
	x axis = s			
$s = \frac{(u + v)}{2} t$	y axis = v			
	x axis = s			
$w = \frac{\lambda D}{s}$	y axis = λ			
	x axis = w			



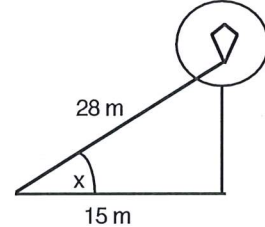
Trigonometry Worded Questions 1.

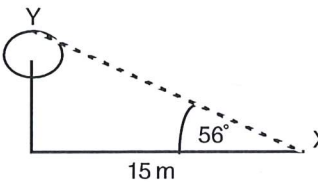


- 1). A ladder that is 6 metres long is placed against a wall. It makes an angle of 34° with the wall. Find
- how high up the wall it reaches,
 - the distance the base of the ladder is away from the wall.

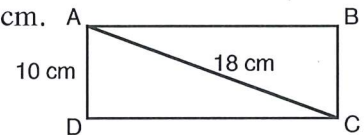


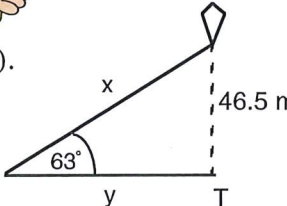
- 2). A boy gets his kite stuck in a tree. He knows that the amount of string let out is 28 metres and the distance he is from the tree is 15 metres. Find
- the angle, x , that the string makes with the ground,
 - how high up the tree the kite is.



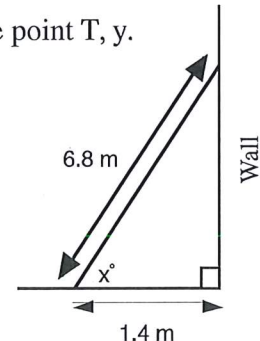
- 3).  Find the height of the tree and the distance XY.

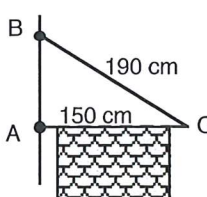
- 4). ABCD is a rectangular sheet of paper. AC = 18 cm and AD = 10 cm. Calculate
- the angle BAC,
 - the length of AB, in cm, to 1 d.p..



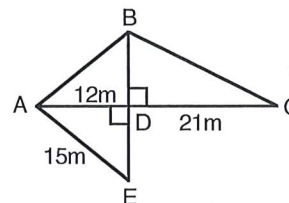
- 5).  A boy flies a kite. The string makes an angle of 63° to the ground. The kite is 46.5 metres vertically above a point T. Find
- the length of string needed, x ,
 - the distance from the boy to the point T, y .

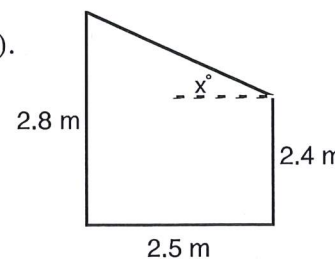
- 6). A ladder, 6.8 m long, leans against the vertical wall of a house. The foot of the ladder is 1.4 m from the wall on horizontal ground.
- Calculate, to the nearest degree, the size of the angle, x° , which the ladder makes with the ground.
 - Calculate the height of the top of the ladder above the ground to the nearest cm.



- 7).  Two metal rods are hinged at C. A and B are attached to a vertical wall. AC is horizontal.
- Calculate AB (to 2 s.f.).
 - Find $\angle BCA$ to the nearest degree.
 - Find $\angle ABC$ to the nearest degree.

- 8). In the diagram $BD = DE$.
- Find
- DE,
 - $\angle DAE$,
 - BC,
 - $\angle BCD$.



- 9).  The cross sectional area of a shed is a trapezium. The taller side is 2.8 metres and the shorter side is 2.4 metres. The distance between the sides is 2.5 metres. Find
- the angle of slope of the roof with the horizontal,
 - the length of the sloping roof.

Using the suvat equations, answer the questions below:

$$v = u + at \quad s = ut + \frac{1}{2}at^2$$
$$s = \frac{(v + u)}{2}t \quad v^2 = u^2 + 2as$$

1. A body starts from rest ($u=0$) and accelerates at 3ms^{-2} for 4s. Calculate
 - a. Its final velocity
 - b. The distance travelled

2. Calculate the quantities indicated:
 - a. $U = 0$ $v = 20$ $t=8.0,$ $a=$ _____
 - b. $U=10$ $v= 22$ $a = 1.5$ $t=$ _____
 - c. $U=15$ $v=10$ $a=-0.5,$ $t=$ _____ $s=$ _____

3. A car moving with velocity 10m/s accelerates uniformly at 2ms^{-2} . Calculate its velocity after travelling 200m

4. How far does a body travel in the fourth second if it starts from rest with a uniform acceleration of 2ms^{-2} ?

5. It is required to uniformly accelerate a body from rest to a velocity of 12ms^{-2} in a distance of 0.2m. Calculate the acceleration.

6. Calculate the quantities indicated (assume that all quantities are in SI units):
 - a. $u=0$ $a=10$ $s=45$ $t=$ _____
 - b. $u=15$ $a=-1.5$ $v=6$ $s=$ _____

7. In an electron gun, an electron is accelerated uniformly from rest to a velocity of $4.0 \times 10^7 \text{ m/s}$ in a distance of 0.10m. Calculate the acceleration.