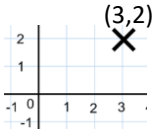
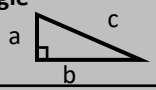
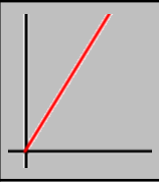
Year 9 Unit 2: Graphs and Proportion

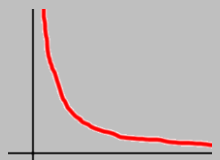
COORDINATES

axis (plural: axes)	the **x axis** is **horizontal** the **y axis** is **vertical**
quadrant	the **four regions** separated by the axes
coordinate *e.g.* 	give a **position** of a **point** on a grid the **first number** (**x**) moves **left** (-) or **right** (+) the **second number** (**y**) moves **up** (+) or **down** (-) (**x**, **y**) *e.g. (3,2) means the point that is 3 to the right and 2 up from the origin*
origin	the coordinate **(0, 0)**
line segment	a line joining **two points**
length of line segment	**distance** between two points calculated using **Pythagoras' theorem**.
Pythagoras' theorem	a relationship between the **3 sides** on a **right angled triangle**  $a^2 + b^2 = c^2$
midpoint	the **middle** of a **line segment**

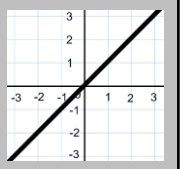
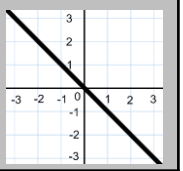
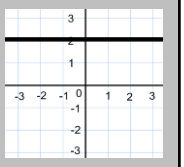
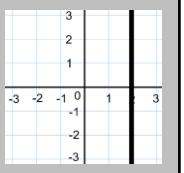
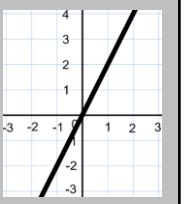
DIRECT PROPORTION

direct proportion	**as one increases**, the other **increases** at the **same rate** if **y is directly proportional to x**, this can be written as **$y \propto x$**
y = kx	an equation of the form **y=kx** represents direct proportion, where k is the **constant of proportionality**
direct proportion graphically	

INVERSE PROPORTION

inverse proportion	if two quantities are in inverse proportion, as **one increases**, the **other decreases** in **proportion** their **product** is always **the same** if **y is inversely proportional to x**, this can be written as **$y \propto \frac{1}{x}$**
$y = \frac{k}{x}$	an equation of the form $y = \frac{k}{x}$ represents inverse proportion, where **k** is the **constant**
inverse proportion graphically	

LINEAR GRAPHS

y = x	every point on this line, the **y coordinate** is **equal to** the **x coordinate** *e.g. (3,3), (-2,-2), (0,0)*	
y = -x	every point on this line, the **y coordinate** is **equal to** the **negative** of the **x coordinate** *e.g. (3, -3), (-2,2)*	
y = a	these lines are always **horizontal** *for example y = 2, every point on this graph, the y coordinate equals 2,* *e.g. (0,**2**), (5,**2**)*	
x = a	these lines are always **vertical** *for example x = 2, every point on this graph, the x coordinate equals 2,* *e.g. (**2**,0), (**2**,5)*	
y = kx	these lines always go through the **origin** *for example y = 2x, every point on this graph, the y coordinate is double the x coordinate, e.g. (2, 4), (1, 2)*	
y = mx + c	the **general equation** of a **linear graph** **m** is the **gradient** **c** is the **y-intercept** **when plotting:** use a **table of values, substitute** in values of **'x'** to generate **'y', plot the coordinates, join with line**	
gradient	How **steep** a line is. Can be positive or negative. $\frac{\text{(Change in y)}}{\text{(Change in x)}}$ It gives the **rate of change**.	
y- intercept	where the line **crosses** the **y-axis (0, a)**	

SCALE

scale	the **ratio** of the **lengths** in a **model/map/diagram** to the **lengths** in **real life**
scale factor	the **ratio** of **corresponding sides** of **two similar shapes**
units in scales	**scales *with* units**: use the **box method** to find the new value giving it in the correct units **scales *without* units**: **both sides** of the scale have the **same unit stated** in the **question,** use the **box method** to find the new value and then **convert** the answer **to sensible units**