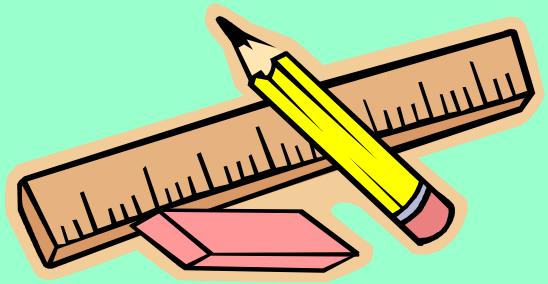
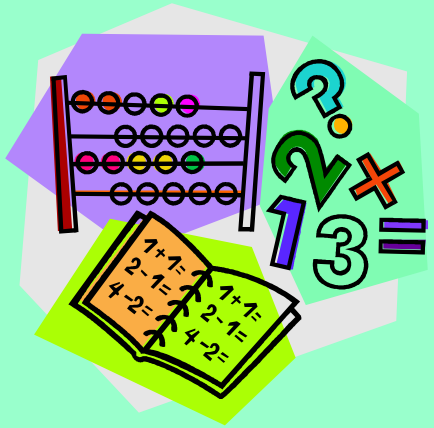
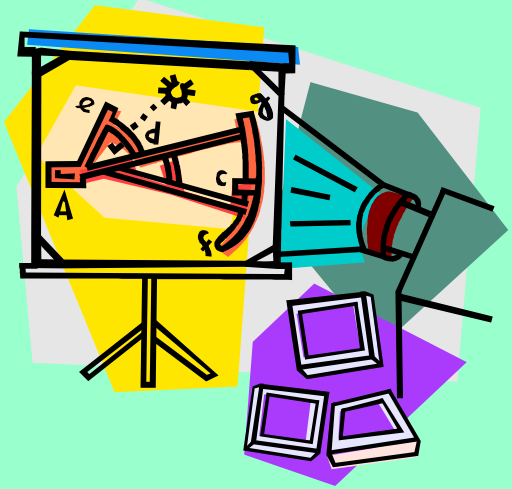
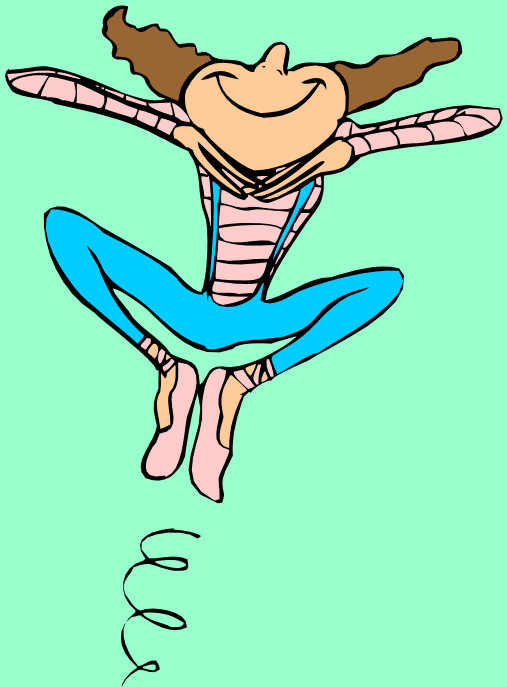






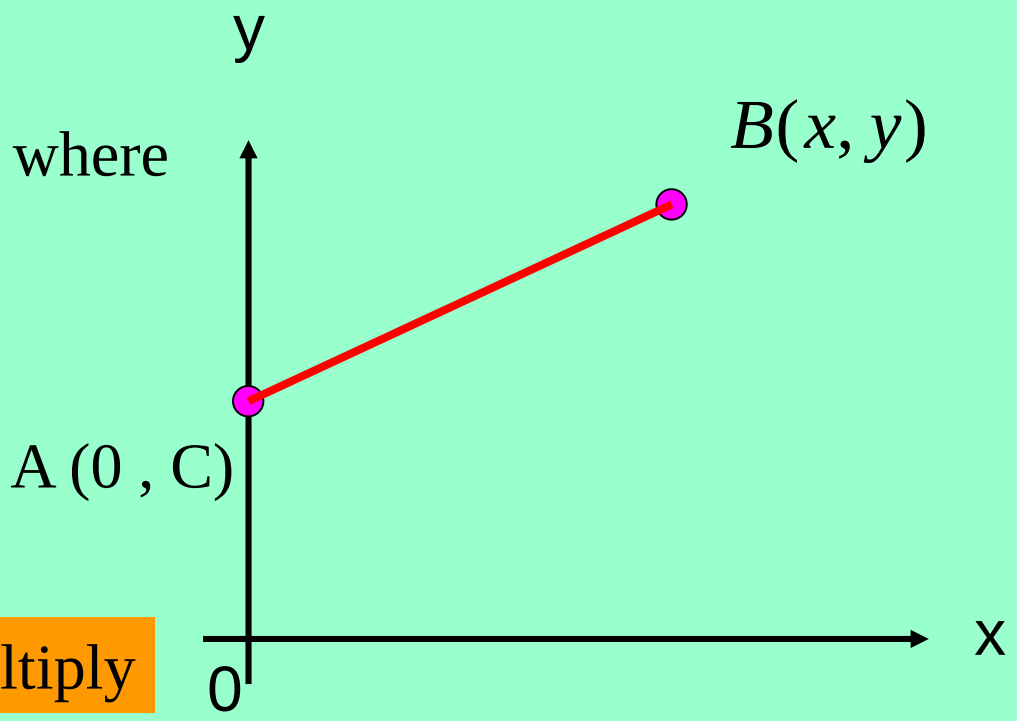
6. Equation of a straight Line



$$y = mx + c$$

Equation of a Straight Line

Take two points on a straight line, one of which is the point where The line crosses the y-axis.



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y - c}{x - o}$$

$$\frac{y-c}{x} = \frac{m}{1}$$ ← Cross Multiply

$$y - c = mx$$

$$y = mx + c$$

Copy the following:

Equation of a Straight Line

To find the equation of a straight line if we know y-intercept use:

$$y = mx + c$$

Gradient

y-intercept

May have to find using

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example 1

Find the equation of the line passing through (0 , 3) and (7 , 5)

(x_1, y_1) (x_2, y_2)

Solution:

1. If not given find gradient

$$m = \frac{5-3}{7-0} = \frac{2}{7}$$

2. Find y-intercept

Given in question → (0 , 3)

C = +3

3. Write down equation in form
   y = mx + c

$$y = \tfrac{2}{7}x + 3$$

Example 2

Find the equation of the line which passes through (0 , 4) and which is parallel to **4x + 6y = 12**

Solution:

1. Re-arrange into y = mx + c form

$$6y = -4x + 12$$

$$y = -\frac{4}{6}x + \frac{12}{6}$$

2. Establish gradient

Parallel so $m_1 = m_2$

$$m = -\frac{4}{6} = -\frac{2}{3}$$

3. Establish y-intercept

Given in question: c = 4

4. Write down equation

$$y = -\frac{2}{3}x + 4$$

Example 3

State whether or not the point (5, 6) lies on the line with equation $y = 4x - 14$

Solution:

1. Substitute $x = 5$ into RHS of equation

$\text{RHS} : 4x - 14 = 4(5) - 14 = 6$

2. Substitute $y = 6$ into LHS of equation

$\text{LHS} : y = 6$

3. Does LHS = RHS ?

LHS = RHS so point must lie on the line

Heinemann, p.8 EX 1E, Q1, 3, 7, 8