13)   Graphs

Part I

1. The coordinates of two points on a straight line are (4,2) and (2,-2). Find the gradient of the straight line

2. Find the equation of the straight line passing through the points (4,3) and (2, -1).

3. What is the intercept of the straight line which passes through the points (-3,0) and (0, -2)?
4. Find the gradient and the intercept of the straight line indicated by the equation $3x - y = 5$.

5. Write the equation of the straight line that pass through the origin and point (2,4).

6. Write the equation of the straight line with gradient $\frac{1}{2}$ which passes through the points (0,-3).

7.
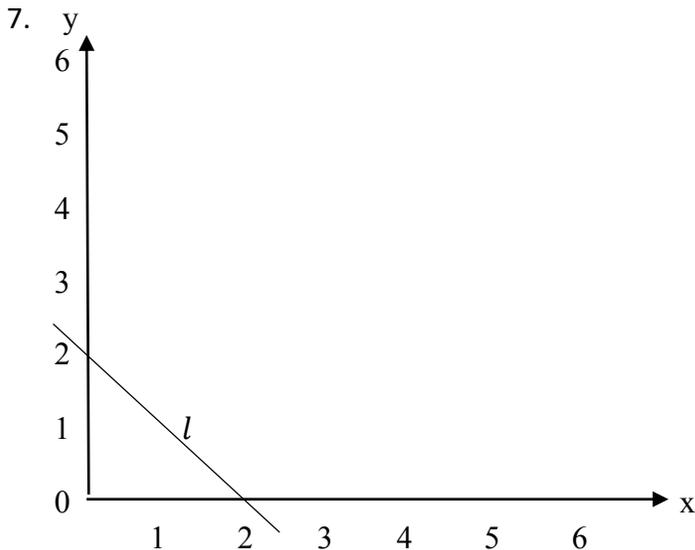
Write the equation of the straight line denoted by l in the figure.

8. Write the equation of the straight line PQ, based on the information in the given figure.
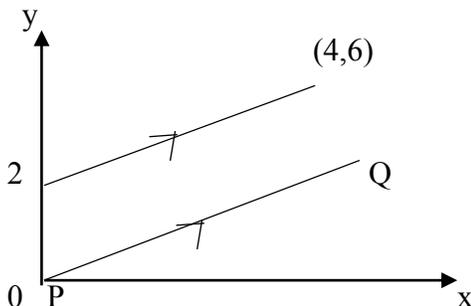
9. Without sketching the graph, write down the following for the function $y = (x - 3)^2 + 2$.

a) Equation of the axis of symmetry.
b) Coordinates of the turning point.

10. If the graph of the function $y = -3x^2 + 2$, moves upwards along the y axis by 3 units. Write the equation of the graph.

Part II

1) An incomplete table of values to draw the graph of the function $y = -x(x + 2) + 3$ is given below.

x	−4	−3	−2	−1	0	1	2
y	−5	0	3	4	3	....	−5

   i.   Find the value of y when x=1.
   ii.   By taking 10 small divisions of the graph paper to represent one unit along the x axis and the y axis, draw the graph of the above function.
   iii. Write the coordinates of the turning point of the function
   iv.   Write the interval of values of x for which the function is positive.
   v.   Using the graph, find the roots of the equation. $-x^2 - 2x + 3 = 0$
   vi.   If the above graph is shifted one unit along the positive direction of the x axis, write the equation of the new graph.

2) The table presents the y values corresponding to several x values of a certain quadratic function of x.

x	−1	0	1	2	3	4	5
y	−3	2	5	6	5	....	−3

   i.   By considering the symmetry of the graph, write down the value of y, when x= 4.
   ii.   Draw the graph of the above quadratic function on the graph paper provided to you, by taking 10 small squares along the x axis and along the y axis to represent one unit as scale.
   iii. Using the graph write down the interval of values of x for which y≥1.
   iv.   Write down the coordinates of the maximum point of the graph.
   v.   If it is given that the quadratic function of x is $y = k - (x - 2)^2$, write down the value of the constant k.
   vi.   Find the value of x for which y=0 for the graph and thereby obtain the value of $\sqrt{6}$ to the nearest first decimal place.

3) The table considering of values of the function $y = (x - 2)^2 - 5$ corresponding to the values of the variable x is given below.

x	−1	0	1	2	3	4	5
y	4	....	−4	−5	−4	−1	4

a) i.   Find the value of y when x=0.
   ii. Taking ten small divisions of the graph paper to represent one unit as scale, draw the graph of the function using the above table.
b) Using your graph,
   i.   Find the roots of the equation $(x - 2)^2 - 5 = 0$ to the first decimal place and hence obtain an approximate value for $\sqrt{5}$.
   ii.   Write down the interval of values of x on which the function increase from -5 to $+3$.