5A Finding Gradients

1. Calculate the gradient of the line which passes through (-2,7) and (4,5)

2. The line joining (2, -5) to (4, a) has a gradient of -1. Calculate the value of a.

5B y=mx+c

1. Write down the gradient and y-intercept of the following graphs

a) $y = -3x + 2$

b) $4x - 2y + 5 = 0$

2. Write each equation in the form ax + by + c = 0

a) $y = 4x + 3$

b) $y = -\frac{1}{2}x + 5$

3. The line y = 4x + 8 crosses the x-axis at P. Work out the coordinates of P.

5C $y-y_1=m(x-x_1)$

1. Find the equation of the line with gradient 5 that passes through the point (3,2)

2. Find the equation of the line which passes through (5,7) and (3,-1)

3. Find the equation of the line which passes through (5,7) and (3,-1)

5D Intersections

1. The line $y = 3x - 9$ crosses the x-axis at coordinate A. Find the equation of the line with gradient $^2/_3$ that passes through A. Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

2. The lines $y = 4x – 7$ and $2x + 3y – 21 = 0$ intersect at point A. Point B has co-ordinates (-2, 8). Find the equation of the line that passes through A and B

5E Parallel Lines

1. A line is parallel to the line $6x + 3y - 2 = 0$ and passes through the coordinate $(3,5)$. Find the equation of the line.

5F Perpendicular Lines

1. Are the following lines perpendicular?

$$3x - y - 2 = 0$$

$$x + 3y - 6 = 0$$

2. Are the following lines perpendicular?

$$y = \frac{1}{2}x$$

$$2x - y + 4 = 0$$

3. A line is perpendicular to the line $2y - x - 8 = 0$, and passes through the coordinate (5,-7). Find the equation of the line.

5G Length of Line Segments

1. Find the distance between the coordinates (2,3) and (5,7)

2. The straight line l_1 with equation $4x - y = 0$ and the straight line l_2 $2x + 3y - 21 = 0$ intersect at point A.

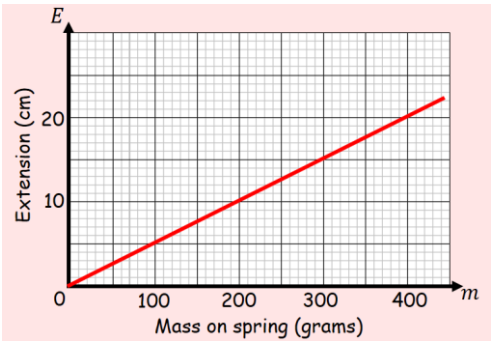
a) Work out the coordinates of A.

b) Work out the area of triangle AOB, where O is the origin and B is the point where l_2 meets the x-axis.

5H Questions in Context

1. The graph shows the extension, E, of a spring where different masses, m, are attached to the end of the spring.

a) Calculate the gradient, k, of the line



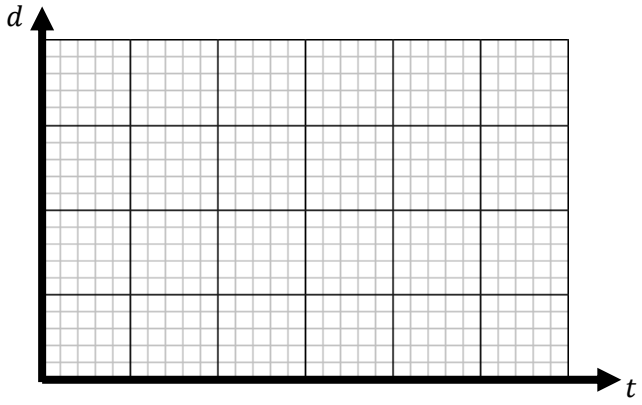
b) Write an equation linking E and m

c) Explain what the value of k represents in this context

2. A container was filled with water. A hole was then made at the bottom of the container. The depth of the water was recorded at various time intervals, and the table shows the results.

Time, t seconds	0	10	30	60	100	120
Depth, d cm	19.1	17.8	15.2	11.3	6.1	3.5

a) Determine whether a linear model is appropriate, by drawing a graph



b) Deduce an equation in the form $d = at + b$

c) Interpret the meaning of the coefficients a and b

d) Use the model to estimate when the container will be empty

3. In 1991 there were 18,500 people living in Bradley Stoke. Planners project that the number of people living in Bradley Stoke would increase by 350 each year.

a) Write down a linear model for the population p of Bradley Stoke t years after 1991

b) Write down one reason why this may not be a realistic model