

You know

- (1) How to find the gradient of a line
- (2) The equation of a straight line and the two things you need to find this.
- (3) The distance formula
- (4) The midpoint of a line
- (5) The gradient of parallel and perpendicular lines

Now put it together. If in doubt, sketch it out! It's all about setting the answer up and thinking logically!

D Grade base building

- (1) Find the equation of the line passing through the point $A(2,1)$ with gradient 3 in the form $y = mx + c$
- (2) Find the equation of the line passing through the point $B\left(\frac{1}{4}, -3\right)$ with gradient $-\frac{1}{2}$ the form $y = mx + c$
- (3) Write your answer to question 2 in the form $ax + by + c = 0$
- (4) Find an equation of the line passing through the points $P(2,1)$ and $Q(3,11)$
- (5) Write down the equation of a line parallel to $y = 1 + 4x$ that passes through the origin.
- (6) Find the length of the line segment AB where $A(2,1)$ and $B(7,-4)$ giving your answer as a surd.

C Grade questions

- (1) Find an equation of the line parallel to $y = 2 - 3x$ that passes through the point $A(4, -1)$
- (2) Find the equation of the line perpendicular to $y = 2x + 4$ that passes through the origin.
- (3) The line $y = 2x - 6$ crosses the x at P and the y axis at Q . Use the distance formula to find the length PQ giving your answer as a simplified surd.
- (4) The line passing the points $C(6, p)$ and $D(2,4)$ has a gradient of 4. Find the value of p .
- (5) Show the point $A(2,1)$ doesn't lie on the line parallel to $2y - 4x = 7$ that passes through the point $(7, -4)$.

B Grade questions

- (1) Find an equation of the perpendicular bisector of the line segment AB where $A(2,2)$ and $B(6,6)$.
- (2) The lines $y = 2x + 1$ and $y = 3x - 2$ meet at the point P . Find the length OP where O is the origin. Give your answer in exact form.
- (3) The line $3x - 4y = 12$ crosses the coordinate axis at the points A and B . Find the area of the triangle AOB where O is the origin.
- (4) The line l_1 is perpendicular to the line $5x + 4y = 6$ and crosses the x axis five units from the origin in the positive x direction. Find where it crosses the y axis
- (5) A line passes through the points $A(2,1)$, $B(7,-4)$, $C(6, p)$ and $D(q, 4)$. Find the values of p and q

A Grade questions

- (1) The line $x + 2y = 18$ crosses the y axis at P . The line l_1 with gradient 4 that passes through the origin meets the line $x + 2y = 18$ at the point Q . Find the area of the triangle OPQ where O is the origin.
- (2) A square has vertices $A(6,4)$, $B(8,2)$, $C(6,0)$, $D(p, q)$. (a) Find the values of p and q and (b) Find the equation of the line passing through the points A and D in the form $ax + by + c = 0$
- (3) AB is a diameter of a circle where $A(6,2)$ and $B(14,-4)$. Find (a) the circumference of the circle in the form $k\pi$ and (b) the area of the circle in the form $p \times k\pi$ where k is an integer and p is an exact fraction.
- (4) Show that the point $A(2,-1)$ doesn't lie on the perpendicular bisector of the line segment BC where $B(2,-4)$ and $C(6,4)$ but $D(5,4)$ does.
- (5) The kite $ABCD$ has vertices $A(5,6)$, $B(10,5)$, $C(11,-3)$ and $D(4,1)$. Find (a) The perimeter and (b) the area of the kite. Give your answers in exact surd form where required.

Off the scale questions

- (1) The line $py + 2qx = r$ crosses the coordinate axis Find the area of the triangle AOB where O is the origin. Give your answer in terms of p, q and r
- (2) Given the lines $qy + px = 4$ and $ry = sx - 6$ are perpendicular, express r in terms of p, q and s .