Higher Maths Key Steps and Exam Strategies

1·1 – The gradient between 2 points

To find the gradient between the points (x_1, y_1) and (x_2, y_2) use the formula;

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

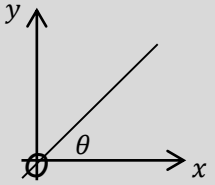
1·2 – The gradient between 2 points

To find the equation of a straight line with gradient, m, passing through the point (a, b) use the formula;

$$y - b = m(x - a)$$

1·3 – Gradient and angle

To find the gradient of a line when given the angle it makes with the POSITIVE direction of the x-axis use the formula;



$$m = tan\theta$$

(and you $\tan^{-1}\theta$ to get the gradient!)

1·4 – The distance between 2 points

To find the distance between two points (x_1, y_1) and (x_2, y_2) either;

(a) use the distance formula…

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

(b) or draw a triangle and use Pythag!

1·5 – Finding the Midpoint

To find the Midpoint of two points

ADD them and half them!

To find the equation of a straight line you need…

1. A point
2. The gradient

1·6 – Parallel & Perpendicular gradients

Parallel lines have the SAME gradient

To find a perpendicular gradient…

turn it upside down and change the sign

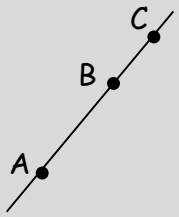
Some useful exact values…

x	0°	30°	45°	60°	90°
$tanx$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞

1·7 – Collinearity

To show the points A, B and C are collinear…

1. Calculate m_{AB}
2. Calculate m_{BC}
3. Write statement



1·8 – Lines associated with triangles

Median (MIDPOINT!)

In the triangle ABC, to find the equation of the median FROM B…

1. Midpoint (of A and C)
2. Calculate m_{BM}
3. y – b… (using m_{BM} and B or M)

Altitude (PERPENDICULAR!)

In the triangle PQR, to find the equation of the altitude FROM Q…

1. Calculate m_{PR}
2. Calculate m_{perp}
3. y – b… (using m_{perp} and Q)

Perpendicular Bisector (BOTH!)

To find the equation of the perpendicular bisector of points E and F…

1. Midpoint (of E and F)
2. Calculate m_{EF}
3. Calculate m_{perp}
4. y – b… (using m_{perp} and M)

1·9 – Points of intersection

To find a point of intersection…

SET THEM EQUAL

R I G U R