Useful formula…

Coordinate Geometry

1. Distance formula: $d = \sqrt{\left(y_2 - y_1\right)^2 + \left(x_2 - x_1\right)^2}$

2. Gradient: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

3. Mid-point (M): $M = \left(\dfrac{x_2 + x_1}{2}, \dfrac{y_2 + y_1}{2}\right)$

4. Slope intercept of a line: $y = mx + c$

5. Point-slope form of a line: $y - y_1 = m\left(x - x_1\right)$

6. Gradients of perpendicular lines: $m_2 = -\dfrac{1}{m_1}$ or $m_1 \times m_2 = -1$

7. Shortest distance from a point (x_0, y_0) to a line $ax + by + c = 0$:

$$d = \frac{\left|ax_0 + by_0 + c\right|}{\sqrt{a^2 + b^2}}$$