SCAN ME

HIGHER MATHS

STRAIGHT LINE CHECKLIST

This checklist covers every skill required by the SQA Course Specification for the Straight Line unit. Use the examples in the Clelland Maths video to master each technique.

1 CORE GRADIENT SKILLS

- [ ] **Calculate Gradient from Two Points**
  Use the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$
- [ ] **Parallel Lines**
  Identify that parallel lines have equal gradients ($m_1 = m_2$)
- [ ] **Perpendicular Lines**
  Use $m_1 \times m_2 = -1$ to find or verify perpendicular gradients
- [ ] **Angles and Gradients**
  Use $m = \tan\theta$ where θ is the angle with the positive direction of the x-axis

TIP **Remember that a negative gradient corresponds to an obtuse angle.**

2 EQUATIONS OF STRAIGHT LINES

- [ ] **Point-Slope Form**
  Use $y - b = m(x - a)$ to find equation given point (a, b) and gradient m
- [ ] **General Form**
  Rearrange equations into forms like $y = mx + c$ or $ax + by + c = 0$
- [ ] **Vertical and Horizontal Lines**
  Recognise when a gradient is undefined (vertical) or zero (horizontal)

3 TRIANGLE GEOMETRY (THE "BIG THREE")

- [ ] 

Medians
Connects a vertex to the midpoint of the opposite side

- [ ] 

Altitudes
Passes through a vertex and is perpendicular to the opposite side

- [ ] 

Perpendicular Bisectors
Passes through the midpoint of a line segment at a right angle

4 ADVANCED REASONING & PROOF

- [ ] **Collinearity**
Prove collinearity by showing they share a common point and the segments have equal gradients

- [ ] **Simultaneous Equations**
Find the point of intersection between two straight lines

- [ ] **Angle with the y-axis**
Calculate acute angle with y-axis by first finding the angle with the x-axis

🎓 SQA EXAM TIPS

- **Exact Values:** Do not use decimals for gradients unless specified; keep them as simplified fractions or surds.
- **Justification:** For collinearity marks, you must state: "Since gradients are equal and there is a common point, the points are collinear".
- **Non-Calculator Fluency:** Most straight line questions appear in Paper 1; practice your fraction arithmetic and surd manipulation.