10 A body of mass 20 kg is on a rough plane inclined at angle α to the horizontal.
The body is held at rest on the plane by the action of a force of magnitude P N.
The force is acting up the plane in a direction parallel to a line of greatest slope of the plane.
The coefficient of friction between the body and the plane is μ.

(a) When $P = 100$, the body is on the point of sliding down the plane.

Show that $g \sin \alpha = g\mu \cos \alpha + 5$. **[4]**

(b) When P is increased to 150, the body is on the point of sliding up the plane.

Use this, and your answer to part **(a)**, to find an expression for α in terms of g. **[3]**