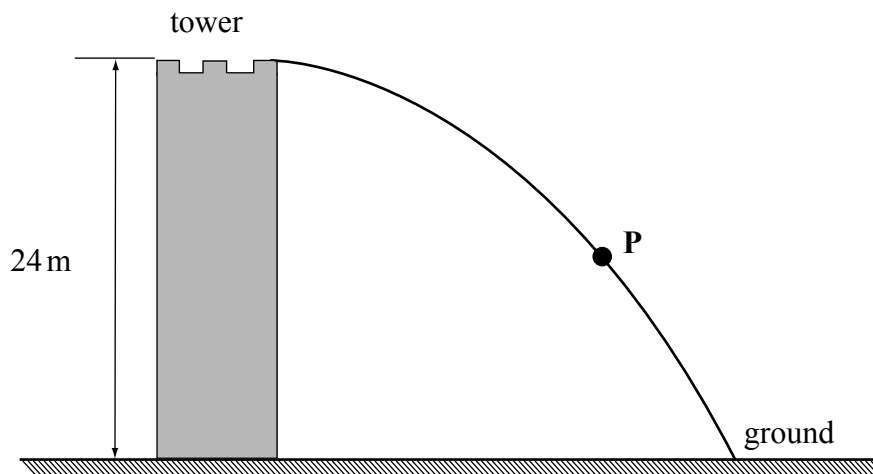*Areas outside
the box will
not be scanned
for marking*

**4** **Figure 3** shows the path of a ball thrown horizontally from the top of a tower of height 24 m which is surrounded by level ground.

**Figure 3**



**4** (a) Using two labelled arrows, show on **Figure 3** the direction of the velocity, *v*, and the acceleration, *a*, of the ball when it is at point **P**.

*(2 marks)*

**4** (b) (i) Calculate the time taken from when the ball is thrown to when it first hits the ground. Assume air resistance is negligible.

Answer ................................ s

*(2 marks)*

**4** (b) (ii) The ball hits the ground 27 m from the base of the tower. Calculate the speed at which the ball is thrown.

Answer ........................ m s$^{-1}$

*(2 marks)*

**6**