

- 10** A student is attempting to model the flight of a boomerang.
She throws the boomerang from a fixed point O and catches it when it returns to O .

She suggests the model for the displacement, s metres, after t seconds is given by

$$s = 9t^2 - \frac{3}{2}t^3, \quad 0 \leq t \leq 6.$$

For this model,

- (a)** determine what happens at $t = 6$, **[2]**
- (b)** find the greatest displacement of the boomerang from O , **[4]**
- (c)** find the velocity of the boomerang 1 second before the student catches it, **[2]**
- (d)** find the acceleration of the boomerang 1 second before the student catches it. **[2]**