

Name _____

- You have 15 minutes
- No calculators
- Show sufficient work

1. (3 points) A spherical balloon is being inflated so that its diameter is increasing at a constant rate of $2 \text{ cm}/\text{min}$. How quickly is the volume of the balloon increasing when the diameter is 10 cm ?

2. (4 points) The position in meters of a particle at time $t \geq 0$ seconds is given by

$$s(t) = \frac{t^3}{3} - 2t^2 + 10t + 17$$

What is the particle's acceleration at the moment when the particle's velocity is 15 m/s ?
Use correct units in your final answer.

3. (3 points) A curve passes through the point $(1, e^5)$ and has the property that for each point on the curve, the slope of the curve is equal to twice the y -coordinate. What is the equation of the curve?