Name: _____

- **Keep phones off and out sight.**
- **Do not talk during the quiz.**

- **No calculators, notes, books, or other aids.**
- **Show all work.**

1. You are watching a rocket launch from a spot 12 kilometers away from the launchpad. The rocket flies straight up after launching. Shortly after launch, you use a radar instrument to determine that the rocket is 15 kilometers away from your location, and that the distance between you and the rocket is growing by $\frac{3}{10}$ of a kilometer per second. How quickly is the rocket rising at that instant?

   It may be useful to know that $\sqrt{15^2 - 12^2} = 9$.

(Question 2 is on the back)

2. A spherical balloon is being inflated by a pump. Its volume is increasing by 400 cm^3 per second. How quickly is the radius of the balloon increasing (in cm per second) when the radius is $20cm$?

   (The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$.)