The trunk of a tree is growing. The radius r of the trunk, in centimeters, is given by

$$r(t) = 2\sqrt{t}$$

where t is measured in years.

1. Find the average rate of change from $t = 1$ to $t = 2$ years.

2. Use the h-version of the limit definition of the derivative to find the instantaneous rate of change at $t = 1$ year.

3. Use the a, b-version of the limit definition of the derivative to find the instantaneous rate of change of radius at $t = 1$ year.

4. I promise you that $r(4) = 4$cm and $r'(4) = 1/2$ cm/year. From this data alone, approximate the radius at 4 years and one month. Then compare your approximation with the true value.