

1. Write a formula for the volume of the entire tree trunk.
2. Write a formula for the volume of the interior part containing the dead cells.
3. Write a formula for the volume of the living tissue.
4. Let F be the fraction of the trunk volume that is living tissue. Find a formula for F and simplify it as much as possible.
5. Assume that the trunk radius grows at a rate of 2 cm/month . What is the rate of change in F at the instant when the radius r is 5 times the thickness d .

Quiz 4 Prep.

One of the following problems will appear on the Quiz next Monday. The quiz will only contain one problem and will be 15 minutes in length.

1. The foliage of a bonsai tree you are tending is a perfect sphere. The radius of the foliage is increasing at a rate of 0.5 mm/day . How fast is the volume of the sphere increasing when the radius is 100 mm .

Note that the volume of a sphere is $V = \frac{4}{3}\pi r^3$ where r is the radius.

2. Your trucker friend is 40 km West of base at a coffee shop enjoying a break. You are currently 80 km in your car North of base travelling North (to pick up a shipment of lumber) at a speed of 60 km/h . How fast is the distance between you and your friend increasing at the present time?
3. A 20 m tree has been bent in a storm and makes an angle of 60° with the ground. Some sap is moving down the tree moving at speed 2 m/min . How fast is the distance from the sap to the ground decreasing when the sap is half way down the tree?