

1. Let

$$g(x) = \tan x^2.$$

Find  $g'(x)$ .

2. Let

$$f(x) = \sin^5 3x.$$

Find  $f'(x)$ .

3. A contestant on Survivor lies on the ground and watches a coconut fall straight down from a tree located 30 feet away. When his line of sight to the coconut makes a 30 degree angle with horizontal and the angle of his line of sight decreases at a rate of 6 degrees per second, how quickly is the coconut falling?