

1.  $\frac{d}{dx} [\tan^{-1}(\cot x)] =$  Solve and provide the answer in the simplest form:

2. If  $g(x) = (f(x^3))^2$  and  $f(8) = \frac{1}{4}$ ,  $f'(8) = 2$ , then  $g'(2) =$

3. If  $g(x) = \frac{h(x)}{x}$ ,  $h(2) = 4$ ,  $h'(2) = -3$ , then find slope of normal line to the curve  $g(x)$  at  $x = 2$ .

4. A particle is moving along the hyperbola  $xy = 16$ . As it reaches the point  $(8, 2)$ , the  $y$ -coordinate is decreasing at a rate of  $3 \text{ cm/s}$ . How fast is the  $x$ -coordinate of the point changing at that instant?