

1. If $h(r,s) = 3r^3s^2 - 6r + 3s^3 + 14$, find the following:

a. $\frac{\partial h}{\partial r} =$

b. $\frac{\partial h}{\partial s} =$

c. $h_{rr} =$ $h_{rs} =$

$h_{sr} =$ $h_{ss} =$

d. write the 2nd partials matrix

2. If $g(t,p) = 2e^t p - p^2 (\ln t) + 23$, find the following:

a. $\frac{\partial g}{\partial t} =$

b. $\frac{\partial g}{\partial p} =$

3. If $A(P,t,w) = 12.4P(1.1^t) + 3w + w^P$, find the following:

a. $A_p =$

b. $A_t =$

c. $A_w =$

4. $M(t,s) = s \ln t + 3.75s + t + 2.9^s$

a. Find and properly name the 1st partial derivatives.

b. Find and properly name the 2nd partial derivatives.

c. Write the 2nd partials matrix.

5. $R(s,c) = 50s^2 + 2sc - 20c^2$ is the roadrunner population where s is the number of seeds available in thousands and c is the coyote population in hundreds.

a. Find and write a sentence of practical interpretation for $R(6,5)$.

b. Find and write a sentence of practical interpretation for $R_s(6,5)$.

c. Find and write a sentence of practical interpretation for $R_c(6,5)$.

d. Using your answers from above, give an estimate for $R(6,5.25)$. *Show how you obtained your answer.*