

Exam

Name _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

1) Laura's internet services has the following short-run cost curve: $C(q, K) = \frac{25q^3}{K^{2/3}} + rK$ where q is Laura's output

level, K is the number of servers she leases and r is the lease rate of servers. Laura's short-run marginal cost function is: $MC(q, K) = \frac{50q}{K^{2/3}}$. Currently, Laura leases 8 servers, the lease rate of servers is \$15, and Laura can

sell all the output she produces for \$500. Find Laura's short-run profit maximizing level of output. Calculate Laura's profits. If the lease rate of internet servers rise to \$20, how does Laura's optimal output and profits change?

2) Homer's Boat Manufacturing cost function is: $C(q) = \frac{75}{128}q^4 + 10,240$. The marginal cost function is:

$MC(q) = \frac{75}{32}q^3$. If Homer can sell all the boats he produces for \$1,200, what is his optimal output? Calculate Homer's profit or loss.

3) Sarah's Pretzel plant has the following short-run cost function: $C(q, K) = \frac{wq^3}{1000K^{3/2}} + 50K$ where q is Sarah's

output level, w is the cost of a labor hour, and K is the number of pretzel machines Sarah leases. Sarah's

short-run marginal cost curve is $MC(q, K) = \frac{3wq^2}{1000K^{3/2}}$. At the moment, Sarah leases 10 pretzel machines, the

cost of a labor hour is \$6.85, and she can sell all the output she produces at \$35 per unit. If the cost per labor hour rises to \$7.50, what happens to Sarah's optimal level of output and profits?