

You may use a calculator and your homework, but not your books or notes. There are three problems worth 10 points each. **Show all of your work to receive full/partial credit.**

- 1) Evaluate or estimate each expression based on the following table.

$x$	-3	-2	-1	0	1	2	3
$f(x)$	1	2	4	2	1	0.5	0.25

a)  $f(-1) = 4$

b)  $f(1) = 1$

- 2) Given  $g(x) = 2x^2 - x + 1$ , find

a)  $g(0) = 2(0)^2 - (0) + 1 = 1$

b)  $g(-1) = 2(-1)^2 - (-1) + 1 = 2 + 1 + 1 = 4$

c)  $g(r) = 2r^2 - r + 1$

d)  $g(x+h) = 2(x+h)^2 - (x+h) + 1$

$$= 2(x^2 + 2xh + h^2) - x - h + 1 = 2x^2 + 4xh + 2h^2 - x - h + 1$$

(expansion not necessary)

3) (#20 from 1.2) The Audubon Society at Enormous State University (ESU) is planning its annual fund-raising "Eat-a-thon". The society will charge students 50¢ per serving of pasta. The only expenses the society will incur are the cost of the pasta, estimated at 15¢ per serving, and the \$350 cost of renting the facility.

a) (6 points) Write down the associated cost, revenue, and profit functions.

$$C(x) = 0.15x + 350$$

$$R(x) = 0.50x$$

$$P(x) = R(x) - C(x) = 0.50x - (0.15x + 350) = 0.35x - 350$$

b) (2 points) How many servings of pasta must the Audubon Society sell in order to break even?

set  $P(x) = 0$ , solve for  $x$

$$0.35x - 350 = 0 \rightarrow 0.35x = 350$$

$$x = 100$$

(you could also set  $R = C$  and solve for  $x$ )

c) (2 points) What profit (or loss) results from the sale of 1,500 servings of pasta?

$$P(1500) = 0.35(1500) - 350 = \$175$$

$\$175$  profit.