(1) [8] A box contains two types of chocolate candies: caramels and creams. A box contains 60 candies and sells for $8.00. Caramels cost $0.12 each to produce while the creams cost $0.16 each to produce. How many of each type of candy should a box contain so that there is no profit or loss?

Let x = number of caramels

y = number of creams.

① $x + y = 60$

② $0.12x + 0.16y = 8$

Using ① : $y = 60 - x$

substituting into ② : $0.12x + 0.16(60-x) = 8$

$$-0.04x = 8 - 9.6$$

$$x = \frac{-1.6}{-0.04} = 40$$

∴ $y = 60 - 40 = 20$

∴ Box should contain 40 caramels and 20 creams.

(2) [7] A manufacturer produces paper hats for a sporting event. The hats cost $0.50 each to produce and there is a one time cost of $240 to initiate production. The hats sell for $1.10 each. Determine the break even point.

Let x = number of hats produced.

$$C = 0.5x + 240$$

$$R = 1.10x$$

Break even: $\qquad C = R$

$$0.5x + 240 = 1.10x$$

$$0.6x = 240$$

$$x = 400$$

$$\therefore R = (400)(1.10) = 440$$

$\therefore$ The break even point is $x = 400$ hats at which $R = C = \$440$.