

(1) [8] A box contains two types of doughnuts: plain and jelly. A box contains 30 doughnuts and sells for \$15.00. Plain doughnuts cost \$0.40 each to produce while the jelly doughnuts cost \$0.60 each to produce. How many of each type of doughnut should a box contain so that there is no profit or loss?

Let x = number of plain doughnuts.
 y = number of jelly doughnuts.

$$x + y = 30 \quad \textcircled{1}$$

$$0.4x + 0.6y = 15 \quad \textcircled{2}$$

From $\textcircled{1}$: $y = 30 - x$

sub. into $\textcircled{2}$: $0.4x + 0.6(30 - x) = 15$

$$0.4x + 18 - 0.6x = 15$$

$$-0.2x = -3$$

$$x = 15$$

$$\therefore y = 30 - 15 = 15$$

\therefore Each both should contain
15 plain and 15 jelly doughnuts.

(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: $C = R$

$$0.5x + 240 = 1.10x$$

$$0.6x = 240$$

$$x = 400$$

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

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