Round 3

A) The cost per pound of the beans is \$1.60, while the corn costs \$.90 per pound.
   Let x denote the # pounds of beans needed. Then:
   $1.60x + 0.90(30) = 1.10(30 + x) \Rightarrow 160x + 2700 = 3300 + 110x \Rightarrow 50x = 600 \Rightarrow x = \underline{\mathbf{12}}$

B) For $x = k$, $y = 3k + 2$
   For $x = k + 3$, $y = 3(k + 3) + 2 = 3k + 11$
   Thus, $3k + 11 = 2(3k + 2) + 1 \Rightarrow 3k = 6 \Rightarrow k = \underline{\mathbf{2}}$
   Check: For $x = 2$, $y = 8$. For $x = 5$, $y = 17$. $(17 = 2 \cdot 8 + 1)$

C) $3X + 7Y = 92 \Rightarrow X = \dfrac{92 - 7Y}{3} = 30 - 2Y + \dfrac{2 - Y}{3}$ Clearly, our choices for Y are restricted to 2,
   5, 8, 11 …, so that the last term is an integer. Thus, we have ordered pairs $(X, Y) = (26, 2)$,
   $(19,5)$, $(12, 8)$, $(5, 11)$.
   Note that since the slope of the line $3X + 7Y = 92$ is $\dfrac{-3}{7}$ or $\dfrac{3}{-7}$, as X decreases by 7, Y
   increases by 3.
   Therefore, we look no further. (The next ordered pair would be $(-2, 14)$.)
   Since $X + Y < 25$, the possible ordered pairs are $\underline{\mathbf{(19, 5)}}$, $\underline{\mathbf{(12, 8)}}$ and $\underline{\mathbf{(5, 11)}}$.