#12. $R_0 = q_0 p_0 = (120)(\$30)$; $d = 10$, $c = \$2$

$R(n) = (120 + 10n)(30 - 2n)$, n = # of \$2 price reductions

$= 3600 + 60n - 20n^2$

$R'(n) = 60 - 40n = 0$, $n = \frac{60}{40} = \frac{3}{2}$

Price $p(n) = p\left(\frac{3}{2}\right) = 30 - 2\left(\frac{3}{2}\right) = \boxed{\$27}$

#16 Instead of revenue, the fcn to max-imize is yield $Y = b \cdot t$, where b = bushels/tree, $t = \frac{\text{trees}}{\text{acre}}$

$Y_0 = b_0 t_0 = \left(12 \frac{\text{bu}}{\text{tree}}\right)\left(30 \frac{\text{trees}}{\text{acre}}\right)$

$Y(n) = (12 - .1n)(30 + 1n)$, n = # of single added tree per acre, $c = .1$, $d = 1$

$Y(n) = 360 + 12n - 3n - .1n^2$

$= 360 + 9n - .1n^2$

$Y'(n) = 9 - .2n = 0$, $n = \frac{9}{.2} = \frac{90}{2} = \boxed{45 \text{ trees added}}$

Since $d = 1$, $b(n) = 12 - .1n = 12 - .45 = 11.55$ bu/tree

$t(n) = 30 + 45 = 75$ trees/acre

The second part asks what the max number of bushels will be if there are 10 acres.

Each acre has 75 trees, each tree yields 11.55 bu.

So, $75 \frac{\text{trees}}{\text{acre}} \cdot 11.55 \frac{\text{bu}}{\text{tree}} \cdot 10 \text{ acres} = \boxed{1662.5 \text{ bu}}$

(text is wrong)