3. $f(x) = \$42{,}000 - 100x$

3A: $(42{,}000 - 100x) \cdot x = 42{,}000x - 100x^2$

$42{,}000x - 100x^2 - 10{,}000x - 40{,}000 = -100x^2 \cdot 32{,}000x - 40{,}000$

$= -200x + 32{,}000 = 2$

$x = 160$

3B: $P(60) = \$42{,}000 - 100(160) = \$26{,}000$

3C: $\pi(160) = -100(160)^2 + \$32{,}000(160) - \$40{,}000 = \$1{,}600{,}000$

4. $1000 = x \cdot 2y$

$x = 1000 - 2y$

$A = xy = (1000 - 2y)y = 1000y - 2y^2$

$A' = 1000 - 4y = 0$

$y = 250$

$x = 1000 - 2(250) = 500$

$A = xy = (500)(250) = 125{,}000$ square feet

5. $50 - 4x$

$y = (100 + x)(50 - 4x) = 5000 - 300x - 4x^2$

$y' = -300 - 8x = 0$

$x = 37.5$

$y = (100 + 37)(50 - 4(37)) = 10{,}625$ bushes per acre

6. $A = 100{,}000(1 + 0.10/4)^{(4 \cdot 25)}$

$A = 100{,}000(1.025)^{48}$

$A = 100{,}000 \cdot 2.08428$

$A = \$208{,}428.58$