

WALNUT TREE PROBLEM

Let x = # of additional trees planted/acre

$20 + x$ = # of trees planted/acres

$60 - 2x$ = yield/tree

Yield/acre = (trees/acre)(yield/tree) Domain given: $[0, 15]$

$$Y(x) = (20 + x)(60 - 2x) = 1200 + 20x - 2x^2$$

MAXIMIZE: $Y'(x) = 20 - 4x$

$$4x = 20$$

$$x = 5 \text{ (note only one c.v.)}$$

CHECK: $Y''(x) = -4 < 0$ (ABS. MAX.)

trees planted = $20 + 5 = 25$

Maximum yield = $Y(5) = (25)(50) = 1250$ lbs/acre