

## Inserts and Additions

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On Figure 2.3, page 32, where tangency point  $e$  marks the point of maximum revenue, the slope of the iso-revenue line ( $-p_a/p_b$ ) equals the slope of the production transformation curve ( $= -MRT$ ); therefore, at the optimum  $MRT = p_a/p_b$ . Here is a calculus proof.

*Proposition:* If a firm with zero production costs is producing that combination of  $X$  and  $Y$  that maximizes profits, then  $p_x/p_y = MRT$

*Proof:* Let  $T(x) = y$  denote the production transformation curve.

Then substituting  $T(x)$  for  $y$  into  $\pi(x,y) = p_x x + p_y y$  yields  $(\pi^*(x) = p_x x + p_y T(x))$ .

Profit maximizing requires  $d\pi^*/dx = p_x + p_y dy/dx = 0$  or  $p_x/p_y = -dy/dx = MRT$ .