Monopsony

A monopsonist has market power in the hiring of its labor, so it faces an upward-sloping supply of labor. In symbols, we could write $w = w(L)$ where w is the wage, L is the number of workers hired, and the condition $w'(L) > 0$ reflects the firm's monopsony power: additional labor can be acquired only by increasing the wage.

The firm's labor cost is the wage times the number of workers hired: $C(L) = w(L) \times L$. To find the firm's marginal resource cost, MRC, we differentiate $C(L)$ with respect to L. Using the product rule, $MRC_L = w(L) + Lw'(L)$. Since $w'(L) > 0$, this proves the proposition stated in the text: $MRC_L > w$, the firm's marginal resource cost exceeds the wage rate.

Note that the MRC is the sum of two terms, the wage rate and $Lw'(L)$. What is the second term? $w'(L)$ is the increase in the wage rate required to obtain one more worker and L is the number of workers hired. Consequently, we can think of $Lw'(L)$ as the total cost of increasing each current worker's wage to the level required to bring in the marginal worker.

Of course, this modification in the firm's market power requires that we revisit the earlier rules for the least-cost and profit-maximizing combinations of labor and capital from the previous chapter. In the interest of generality, suppose the firm has monopsony power in its purchase of capital as well, so that $r = r(K)$ and $r'(K) > 0$. In a manner analogous to the marginal resource cost of labor, we can find that the firm's marginal resource cost of capital is given by $MRP_K = r(K) + Kr'(K)$. Under these conditions, the firm's profit is given by $\pi(L, K) = Pg(L, K) - (w(L)L + r(K)K)$, where P is the market price of the firm's output, and $g(L, K)$ is the firm's production relationship. Differentiating profit with respect to both L and K, we obtain the first-order conditions:

$$\frac{\partial \pi}{\partial L} = P\frac{\partial g}{\partial L} - (w(L) + Lw'(L)) = P\text{x}MP_L - MRC_L = MRP_L - MRC_L = 0$$

$$\frac{\partial \pi}{\partial K} = P\frac{\partial g}{\partial K} - (r(K) + Kr'(K)) = P\text{x}MP_K - MRC_K = MRP_K - MRC_K = 0$$

A simple rearranging of these terms gives the two conditions noted in the footnote of the text: Cost minimization requires equality of each input's ratio of marginal product to marginal resource cost, while profit maximization requires equality of each input's ratio of marginal revenue product to marginal resource cost, and that this ratio equals 1.