

15. Correct. The answer is false. Marginal revenue product is the demand in a competitive input market or $MRP(Q) = P(Q)$. Let costs for the monopolist equal $TC(Q)$. Then we know that the monopolist profits are

$$\pi = P(Q) \cdot Q - TC(Q)$$

F.O.C. are

$$\frac{\partial \pi}{\partial Q} = P(Q) + (\frac{\partial P}{\partial Q}) \cdot Q - \frac{\partial TC}{\partial Q}.$$

But $P(Q) = MRP$, so the first order conditions are that

$$MRP + \frac{\partial (MRP)}{\partial Q} \cdot Q = MC.$$

Which is where marginal revenue $(MRP + (\frac{\partial MRP}{\partial Q}) \cdot Q) =$ marginal cost.

The easiest way to see how marginal revenue is related to marginal revenue product or demand is by using an example. Suppose that marginal revenue product or factor demand is $P = 100 - 2Q$. Then let's fill in prices, total revenues, and marginal revenues for various sales in the table below. When quantity is 0, price is 100, and total revenue is 0. When quantity is 1, price is 98 and total revenue is 98. The marginal revenue for the first unit is $\Delta TR / \Delta Q = 98/1$. To sell two units you have lower price to 96. Total revenue is 192. Marginal revenue is $\Delta TR / \Delta Q = (192 - 98) / 1 = 94$. This is equal to the price 96, which you now receive for all sales. However, you lost \$2 on the first sale because you got 98 on the first sale, but now you only get 96. Thus, your marginal revenue is $MR = P_Q + (\Delta P_Q / \Delta Q) \cdot Q = 96 - 2 \cdot 1$. Computations for sales up to three units are shown in the following table below.

Q	P_Q	TR	$MR = \Delta TR / \Delta Q$	$MR = P_Q + (\Delta P_Q / \Delta Q) \cdot Q$
0	100	0		
1	98	98	98	98
2	96	192	94	$96 - 2 \cdot 1 = 94$
3	94	282	90	$94 - 2 \cdot 2 = 90$