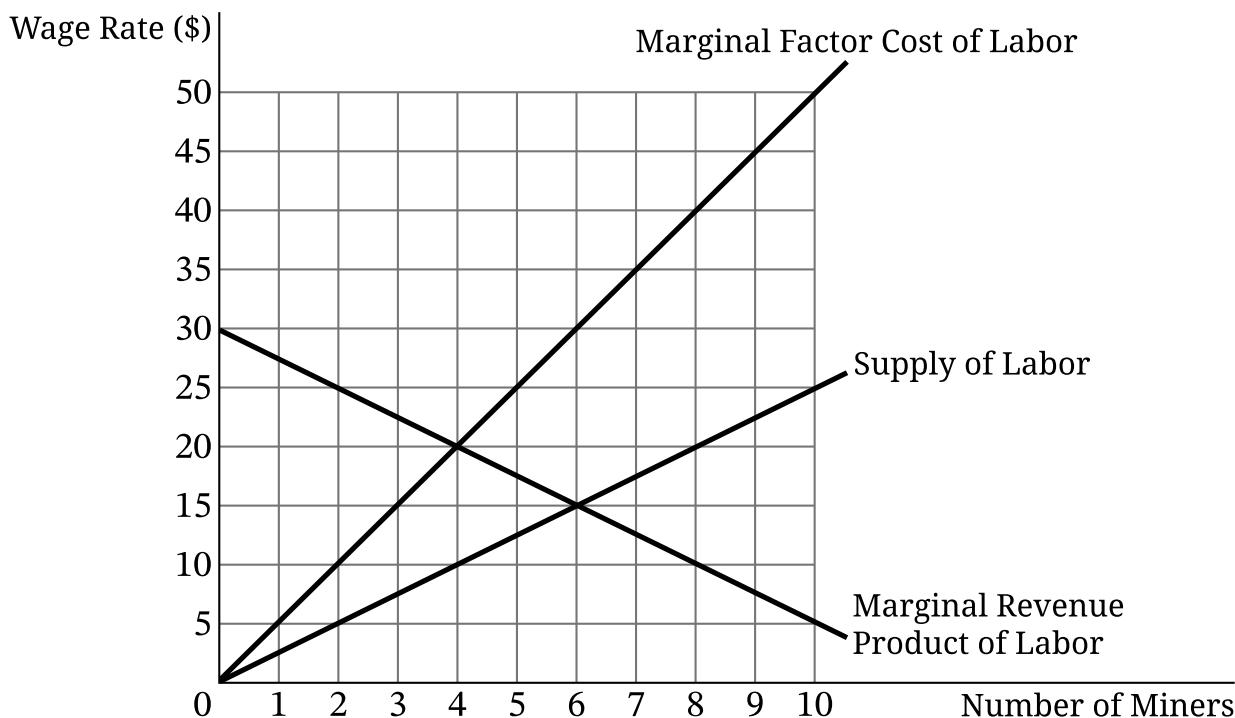


- 1.** Deskward is a typical profit-maximizing firm that produces and sells wooden desks in a constant-cost, perfectly competitive market that is in long-run equilibrium.
 - A.** Draw correctly labeled side-by-side graphs for the wooden desk market and for Deskward and show each of the following.
 - i. The market equilibrium price and quantity, labeled P_M and Q_M , respectively
 - ii. Deskward's profit-maximizing price and quantity, labeled P_F and Q_F , respectively
 - iii. Deskward's average total cost curve consistent with long-run equilibrium, labeled ATC
 - B.** If the monthly rent, a fixed cost, on Deskward's factory building increases, what will happen to the firm's profit-maximizing quantity in the short run? Explain.
 - C.** Suppose the government is considering granting a per-unit subsidy to producers of wooden desks. On your market graph in part A, show the short-run effect of a per-unit subsidy on each of the following.
 - i. The new market equilibrium price and quantity of wooden desks, labeled P^* and Q^* , respectively
 - ii. The area representing the total cost of the subsidy to the government, shaded completely
 - D.** Instead of the per-unit subsidy, suppose the government imposes a binding price floor in the market for wooden desks. Will the price floor result in a shortage of wooden desks, a surplus of wooden desks, or neither? Explain.
 - E.** Deskward also produces chairs. Deskward increases its production from 500 chairs to 600 chairs, and its long-run total cost increases from \$80,000 to \$108,000.
 - i. Calculate Deskward's long-run average total cost of producing 500 chairs. Show your work.
 - ii. As Deskward increases production from 500 chairs to 600 chairs, is Deskward experiencing economies of scale, diseconomies of scale, or the efficient scale? Explain using numbers.

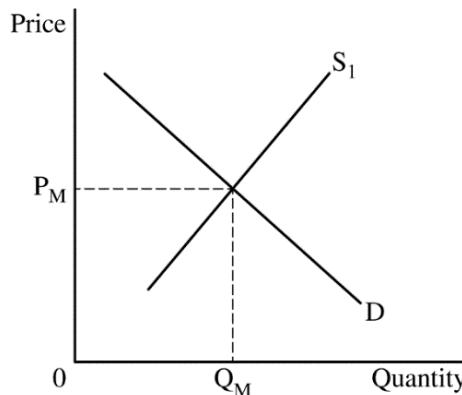
2. Quartz Excavations is a profit-maximizing firm and the only employer of miners of quartz in a small town. The graph provided shows the labor market for miners.



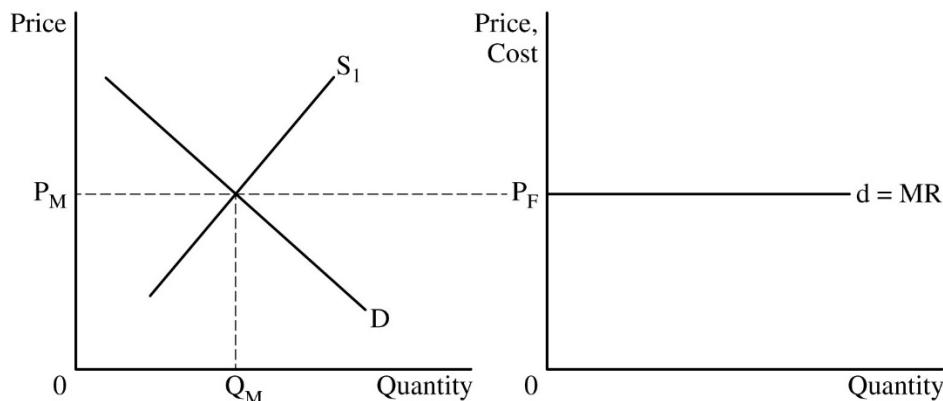
- Identify Quartz Excavations' profit-maximizing number of miners to hire.
- Will Quartz Excavations pay its profit-maximizing number of miners a wage rate that is equal to \$15, greater than \$15, or less than \$15? Explain using numbers.
- Suppose the government sets a minimum wage (a price floor on wages) at \$25. Calculate the total wage bill for Quartz Excavations at the resulting profit-maximizing number of miners. Show your work.
- Suppose that instead of a minimum wage, there is now an increase in the demand for quartz.
 - Will the marginal revenue product of miners increase, decrease, or remain the same? Explain.
 - After the demand for quartz increases, Quartz Excavations hires the new profit-maximizing number of miners. Will the marginal factor cost of the last miner hired be greater than, less than, or equal to the marginal factor cost of the last miner hired before the demand for quartz increased?

Question 1: Long**10 points**

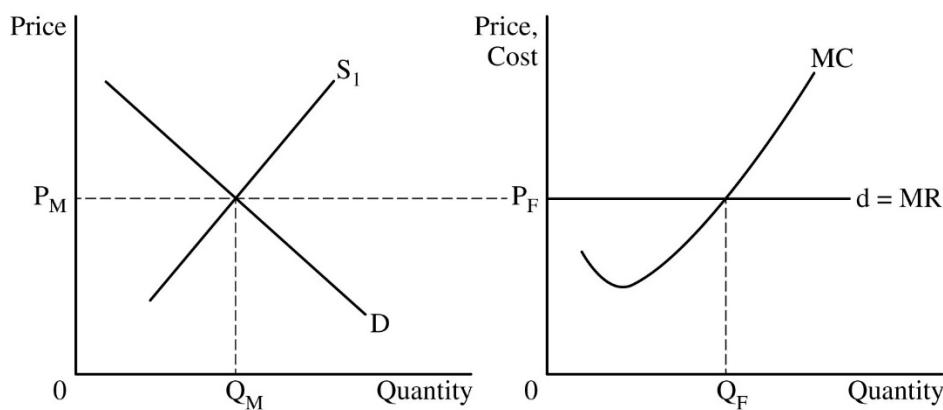
- A** Draw a correctly labeled graph of the market for wooden desks with a downward-sloping demand (D) curve and an upward-sloping supply (S_1) curve and label the market equilibrium price as P_M and the market equilibrium quantity as Q_M . **1 point**
- Point 1



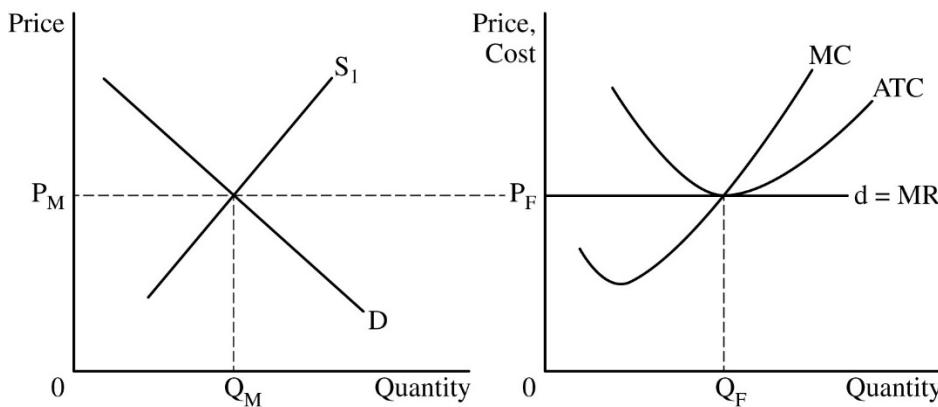
- Point 2 Draw a correctly labeled graph for Deskward that shows the firm's horizontal demand and marginal revenue ($d = MR$) curve extended from the market equilibrium price (P_M) and label the firm's price as P_F . **1 point**



- Point 3 The firm's graph must show a rising marginal cost (MC) curve, and show the firm's profit-maximizing quantity, labeled Q_F , where $MR = MC$. **1 point**

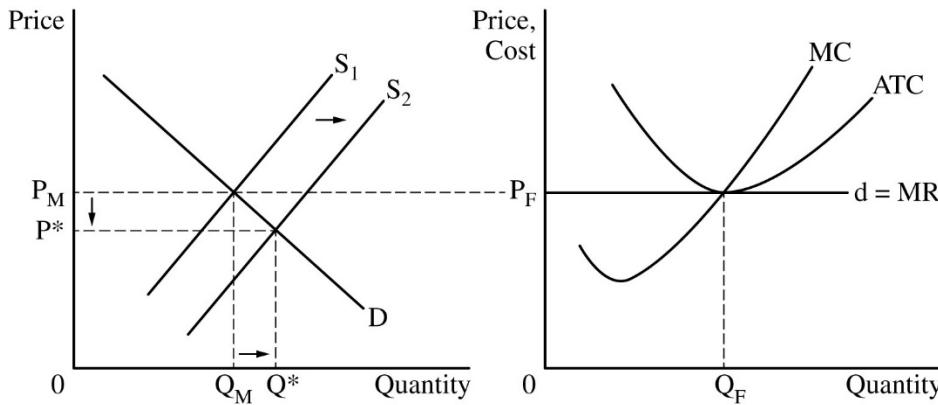


- Point 4** The firm's graph must show the average total cost (ATC) curve tangent to the firm's $d = MR$ curve at Q_F and show the MC curve passing through the minimum point of the ATC curve. **1 point**

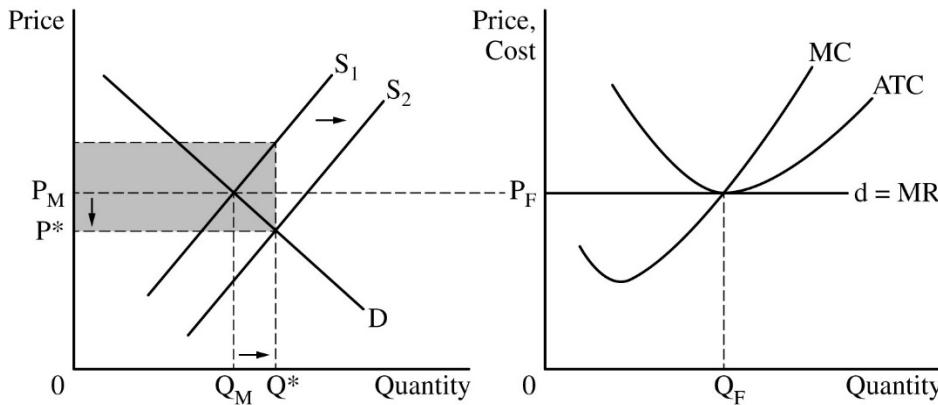


- B** State that Deskward's profit-maximizing quantity will not change in the short run and **1 point**
Point 5 explain that a change in a fixed cost does not affect the firm's marginal cost or marginal revenue.

- C (i)** The market graph from part A must show a rightward shift of the market supply curve and show the new market equilibrium price of wooden desks, labeled P^* , and the new market equilibrium quantity of wooden desks, labeled Q^* . **1 point**
Point 6



- (ii)** The market graph from part A must show the area representing the total cost of the subsidy to the government, shaded completely. **1 point**
Point 7



D	State that the price floor will result in a surplus of wooden desks and explain that the binding price floor is set above the market equilibrium price, which causes the quantity supplied of wooden desks to be greater than the quantity demanded of wooden desks.	1 point
E (i) Point 9	Calculate the long-run average total cost (LRATC) as \$160 per chair and show your work.	1 point
	$\text{LRATC at 500 chairs} = \frac{\$80,000}{500} = \$160$	
(ii) Point 10	State that Deskward is experiencing diseconomies of scale and explain that as output increases from 500 to 600 chairs, its LRATC increases from \$160 to \$180 ($=\$108,000/600$) per chair.	1 point
