Competitive firms and markets.

Recall the conditions for a perfectly competitive market.

1) The good is homogenous
2) Large numbers of buyers and sellers/ freedom of entry and exit (price takers)
3) Perfect information by both buyers and sellers
4) No transaction costs

Focus on the point that firms are price takers in both output and input markets.

[That is to say, a firm can set a selling price higher than the market price or offer to pay less for inputs than the market price, but nobody will buy their product or sell them inputs if they do so]

Profit maximization.

Profit = Revenue – costs.

Questions to be asked when considering profit maximization:

1) Should I produce at all?
2) If so, how much should I produce?
To begin with, let us focus on the case when we should produce an amount larger than zero, and then later consider what would lead the firm to be better off producing zero.

I am going to also assume now that we are in the long run.

I should produce to the point where profit is maximized.

Show graph, with derivatives.

May not know the shape, but you could think of this shape coming from experimentation.

At the peak of the curve, marginal profit equals zero (increasing to the left of the maximum, decreasing to the right of the maximum).
Since we know that \( \Pi(Q) = R(Q) - C(Q) \), we can think of the marginal representation of this as:

\[
\frac{\Delta \Pi}{\Delta Q} = \frac{\Delta R}{\Delta Q} - \frac{\Delta C}{\Delta Q}
\]

\( M\Pi = MR - MC \), or

We can elaborate on this expression a bit since we know that \( \Pi = R - C \) can also be expressed as

\[
\Pi = p \cdot f(x) - w \cdot x \quad \text{or} \quad \Pi = p \cdot Q - c(Q)
\]

We can see that each additional unit of \( Q \) (represented here by \( f(x) \) or \( Q \)) generates an additional revenue of size \( p \).

So in fact, \( MR = p \).

The competitive firm will produce at output level \( Q' \) where \( MC(Q') = p \).

Since \( p = MR \) (and assuming \( p \) is greater than or equal to \( AC(Q') \) as we will see in a moment)
\( M\Pi = 0 \) where \( MR = MC \), and with \( MC = p \), we have \( p = MC \).

Show graph.
If we want, we can think of profit per unit in this case as equal to AR-AC, or price minus average cost. Then profit is Q’*profit per unit.

What if price is not greater than average cost?

Long run production level decision. Consider the point Q’ where MC(Q’)=p. If this point is above AC, then the firm stays in production. If not, shut down.

Note that a similar argument holds in the short run, with regards to price above average variable cost.

Note that p is both MR and AR if that helps.

The competitive firm’s supply curve is the marginal cost curve above the average cost. There is a discontinuity / jump / gap.

Supply slopes up due to the diminishing marginal returns to an input in this short run context, which is why the marginal cost curve is upward sloping.
In the long run, there is no fixed cost / variable cost distinction, so the diminishing marginal returns explanation for the upward sloping curve is not going to hold.

The long run market supply curve is flat (a horizontal line at the minimum point of AC / where MC and AC cross) if and only if:

1) Firms can freely enter and exit
2) Firms are identical
3) Input prices are constant

What would make entry limited? Production requires a limited resource. Government regulations. Entry is costly. This makes it slope up.

What would make firms not be identical? Location, production and regulation environment, climate. This makes it slope up.

What would make input prices vary across firms? If there are only a few firms who use the input (jet engine example) increased demand by competitors should drive up the price of the input (compared to the receptionist example). If there is something about the scale of production allowing different technologies to be used (PC is output, floppy disc is input example), then we can have decreasing input cost as quantity expands.

Competitive firms earn zero economic profit in the long run.
If firms are earning higher than average return to capital (10.5% over the past five years though this is bound to come down given the recent turmoil), other firms will move in, bringing down the price, bringing down the firm’s profit.

Monopoly.
There is only one supplier of a good for which there is no close substitute.

How can such a thing happen?

1) Technical reasons. Economies of scale. A natural monopoly exists when one firm can produce at a lower cost than several firms producing the same good and total output level (AC is downward sloping over the feasible range of output).

2) Legal reasons.
   a. Patents.
   b. Franchises
   c. Legal barriers.

3) Non-competitive behavior.
Marginal revenue, as you recall, is the change in revenue divided by the change in q. In the competitive model, the price taking firm faced a marginal revenue of $p$, since price did not change with the output level of the firm.

Now, the monopoly firm faces the entire demand curve. This is downward sloping, so by picking a level of $q$, there is also an associated $p$ (the whole demand curve is defined by $(p,q)$ pairs).

Illustrate on demand graph ‘lose’ ‘gain’ areas.

Page 65, figure 4.6. Contrast consumer surplus, producer surplus, and deadweight loss outcomes of monopoly and perfectly competitive market.
Chapter 4: Efficiency and the Idealized Competitive Model

Figure 4.6  Monopoly Pricing, Rents, and Deadweight Loss

<table>
<thead>
<tr>
<th></th>
<th>Competitive Pricing</th>
<th>Monopoly Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Surplus:</td>
<td>$P_{ce}e$</td>
<td>$P_{mb}e$</td>
</tr>
<tr>
<td>Total Revenue:</td>
<td>$P_{ce}Q_{e}$</td>
<td>$P_{mb}Q_{mb}$</td>
</tr>
<tr>
<td>Total Cost:</td>
<td>$AC_{e}dQ_{e}$</td>
<td>$AC_{mb}dQ_{mb}$</td>
</tr>
<tr>
<td>Rent:</td>
<td>$P_{cd}AC_{e}$</td>
<td>$P_{mb}AC_{mb}$</td>
</tr>
<tr>
<td>Deadweight Loss:</td>
<td>0</td>
<td>$acf$</td>
</tr>
</tbody>
</table>
Return to the upward sloping supply curve story, and focus on supply curve ‘flat’ or ‘upward sloping’ discussion. This leads to the idea of scarcity rents.

Excess payments to unique resources are ‘scarcity rents’.

If production units are not identical so that there are possible qualitative differences, a market price may generate economic returns to one that are greater than another.

Note ‘rent seeking’ behavior.

Illustrate using supply curve of cotton from Perloff, noting location interpretation.
This also leads to the idea of zero economic profit in the long run if we factor in returns in the form of scarcity rents.