The following notes review some material we covered in lecture on Wednesday, February 3rd. This handout deals with the optimal consumption bundle (OCB).

1. **Tangency**

A brief review of tangency.

**Def:** A line is tangent to a curve at a point (an (x,y) pair) if the line only touches the curve at this specific point (the slope of the line is equal to the slope of the curve at this point).

In this example, Blue Curve is not tangent to the Line.

In this example, Red Curve is tangent to the Line at Point labeled OCB.
2. Tangency and the Optimal Consumption Bundle

We've talked about the idea of affordability (use the budget constraint) and the idea of what a consumer wants, based on preferences (use indifference curves).

We combine these two ideas to determine what the consumer would choose.

**Def:** The optimal consumption bundle is the bundle of goods that is both affordable (contained in the budget constraint) and the most preferred by the consumer (highest indifference curve).

(The OCB is the bundle that maximizes utility (happiness) given the budget constraint.)

This optimal consumption bundle is the bundle of goods the consumer will choose.

**At the optimal consumption bundle the indifference curve is tangent to the budget constraint.** Otherwise, either the bundle is not affordable or the consumer could do better (get a more preferred bundle). This can be seen in the example below.

This means, at the optimal consumption bundle, the MRS of good x for good y is equal to the absolute value of the slope of the budget constraint.

\[
\text{MRS}_{xy} = \frac{P_x}{P_y}
\]

Example:
- Two goods, x and y
- Prices \(P_x\) and \(P_y\)
- Money \(M\)
- Standard preferences (follows from the Four Rules given in class)
First, notice that Point D and Point E are not affordable. They are outside the budget constraint, and thus cannot possibly be the optimal consumption bundle.

Points A, B and C are all affordable (either on the budget constraint or below it).

Now we need to consider which of these bundles is most preferred.

By Rule 1 of indifference curves, higher indifference curves are preferred to lower indifference curves. Thus, Point C must be preferred to Points A and B.

In this example, Point C is the optimal consumption bundle. It is the most preferred of all affordable bundles.

NOTE: The optimal consumption bundle is the one bundle such that the indifference curve is tangent to the budget constraint.

If you are at a bundle such that the indifference curve is NOT tangent to the budget constraint, either the bundle is not affordable (like Points D and E) or the bundle is not the most preferred (like Points A and B).