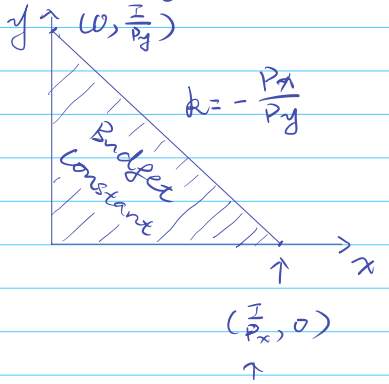
# The Budget Constraint

- depends on consumers income $I$ and prices of good $x$, $y$, denoted as $P_x, P_y$.
- The budget constraint is all bundles of goods $(x, y)$ $x \geq 0, y \geq 0$. satisfying $P_x x + P_y y \leq I$
  the budget line: $P_x x + P_y y = I$.




$$y = \frac{I}{P_y} - \frac{P_x}{P_y} x.$$

the maximum number of good $x$ a consumer could buy.
the intersection on $y$-axis is the maximum number of good $y$.

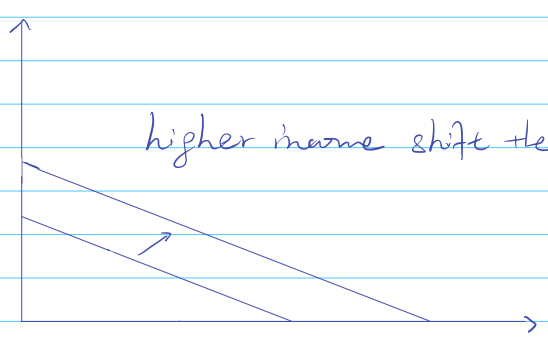
## Change in income:

Ex:

$P_x = 20$, $P_y = 40$, $I_1 = 800$, $I_2 = 1000$

$BL_1: y = 20 - \frac{1}{2}x$

$BL_2: y = 25 - \frac{1}{2}x$

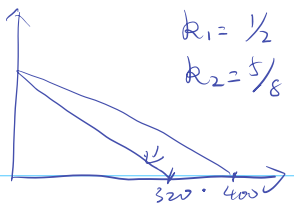


higher income shift the budget line upper-right.

## Change in price: affect the slope and horizontal intersect.

Ex:

$P_{x_1} = 20$ $P_{x_2} = 25$ $P_y = 40$, $I = 800$.




BL rotate down.

## Optimal Choice

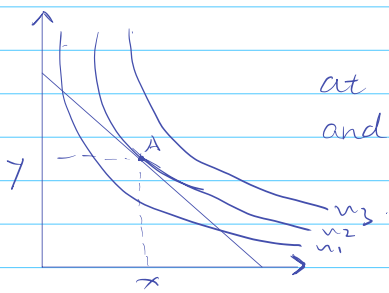
The consumer optimal choice is a bundle of goods that:

1. delivers the highest utility among all bundles in the consumer budget constraint.

$$\max_{x,y \geq 0} u(x,y)$$

← "More is better" will make this an equality

subject $P_x x + P_y y \leq I$.




at the point A, the efficient is highest and the IC has the same slope as $u_2$.

$$MRS_{xy}(x^A, y^A) = -\frac{P_x}{P_y}$$

↑ slope of indifference curve