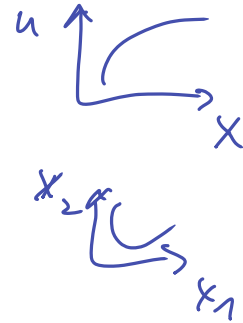
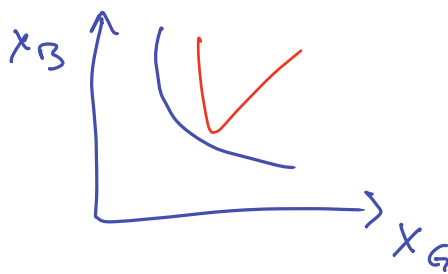


DAY 1

$u = \ln(x)$



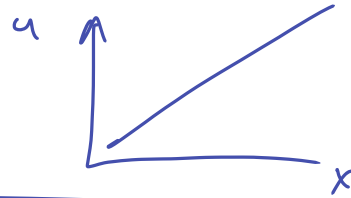
VNM : $EU = p \ln(x_B) + (1-p) \cdot \ln(x_G)$

MRS : $\left. \frac{dx_B}{dx_G} \right|_{u=\text{const}} = - \frac{dEU/dx_G}{dEU/dx_B}$

$$= - \frac{(1-p) \cdot \frac{1}{x_G}}{p \cdot \frac{1}{x_B}}$$

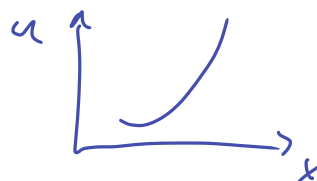
$$\frac{dx_B}{dx_G} = - \frac{(1-p)}{p} \cdot \frac{x_B}{x_G} \quad \uparrow \downarrow$$

Risk-neutral : $u = a - x$



Risk love

$u = x^2$



$$u(w) = \ln(w)$$

$$\Rightarrow u'(w) = \frac{1}{w}$$

$$v''(w) = \left(\frac{1}{w}\right)' = (-w^{-1})' = -w^{-2}$$

$$A(w) = -\frac{u''}{u'} = -\frac{-\frac{1}{w^2}}{\frac{1}{w}} = \frac{1}{w} = A(w)$$

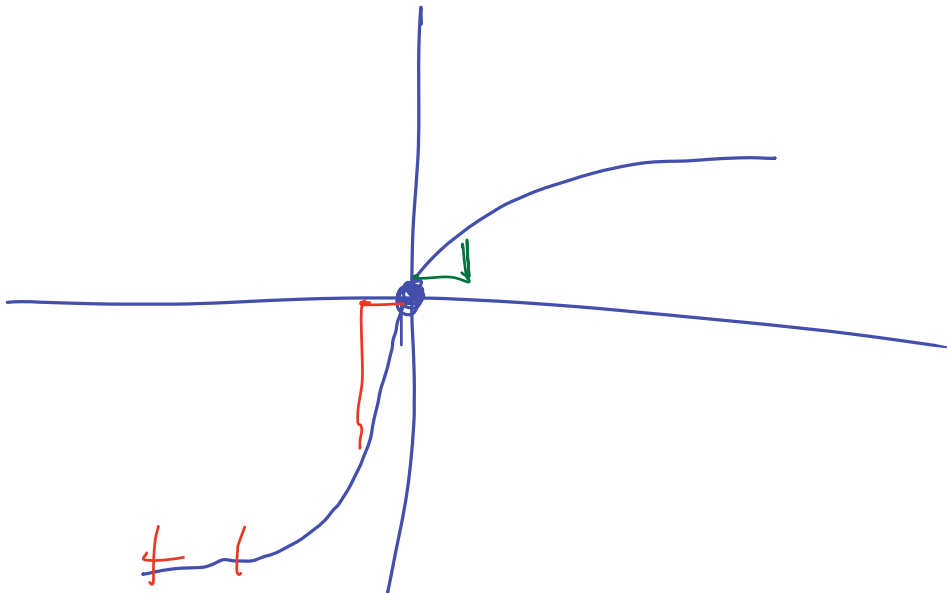
$$R(w) = w \frac{u''}{u'} = w \cdot \frac{1}{w} = 1$$

$$\frac{\partial A(w)}{\partial w} = -w^{-2} = -\frac{1}{w^2} < 0$$

~~DATA~~

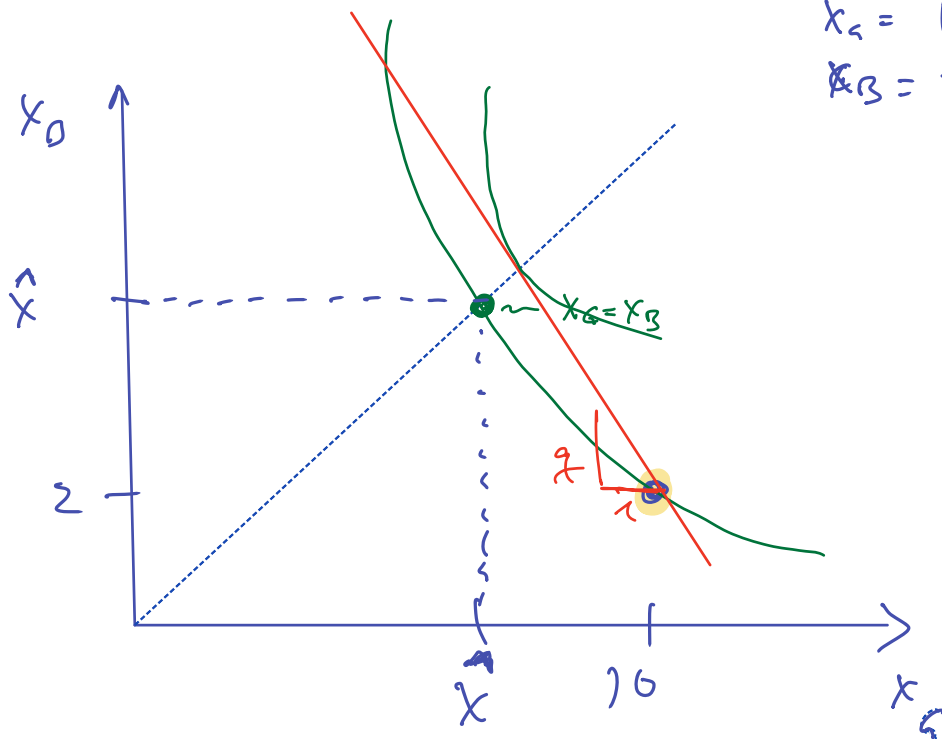
$$\frac{\partial R(w)}{\partial w} = 0$$

(RRA)



$$x_2 = 10$$

$$x_3 = 2$$



d) $X_G = X_B$ On certainty line

$$G - T = B + q \cdot T$$

$$\hookrightarrow T = \frac{G - B}{1 + q}$$

$$\max_T EU = p \cdot u(X_B) + (1-p) \cdot u(X_G)$$

$$\max_T EU = p \cdot u(B + qT) + (1-p) \cdot u(G - T)$$

X_B X_G

$$\frac{\partial EU}{\partial T} = p \cdot \frac{\partial u}{\partial X_B} \cdot \frac{\partial X_B}{\partial T} + (1-p) \cdot \frac{\partial u}{\partial X_G} \cdot (-1) = 0$$

$\underbrace{\quad}_{=q}$

FOC:

$$pq \cdot \frac{\partial u}{\partial X_B} \stackrel{!}{=} (1-p) \cdot \frac{\partial u}{\partial X_G}$$

①
T*

$E(MU)$ of
buying insurance

$E(MC)$
of buying insurance