

ECON 301, Professor Hogendorn

Problem Set 1 Answers

1.  $MRS_a$ .

(a)  $MU_X = \frac{dU}{dX} = \frac{1}{3}X^{-2/3}Y^{2/3} = \frac{1}{3}$ .

(b)  $MU_Y = \frac{dU}{dY} = \frac{2}{3}X^{1/3}Y^{-1/3} = \frac{2}{3}$ .

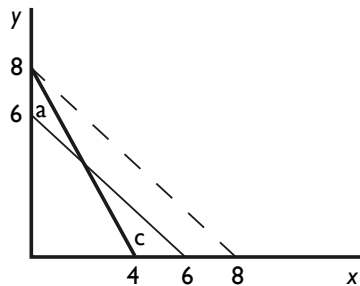
(c)  $\frac{1}{3}5^{-2/3}9^{2/3} = 0.49$ .

(d)  $MRS = -\frac{MU_X}{MU_Y} = -\frac{\frac{1}{3}X^{-2/3}Y^{2/3}}{\frac{2}{3}X^{1/3}Y^{-1/3}} = -\frac{Y}{2X} = -\frac{1}{2}$ .

(e)  $-\frac{Y}{2X} = -\frac{9}{2 \cdot 5} = -\frac{9}{10}$ .

2.  $BuyingXandY_a$

(a)  $10X + 5Y = 40$ . If you spent all your income on  $X$ , you could buy 4. If you spent all your income on  $Y$ , you could buy 8. The slope is  $-8/4 = -2$ . This is represented by the dark budget line in the following graph.



(b)  $5X + 5Y = 40$ .  $Y = 8 - X$ . Slope  $-1$ . Dashed line in graph.

(c)  $5X + 5Y = 30$ .  $Y = 6 - X$ . Slope  $-1$ . Narrow solid line in graph.

(d) Can afford area  $c$  with budget (c) but not (a). Can afford area  $a$  with budget (a) but not (c).