Some Commonly Used Utility Functions (a reference table for you)

Function U(X,Y)	$MU_X(x,y)$ = $\partial U/\partial X$	$MU_Y(x,y)$ = $\partial U/\partial Y$	$MRS_{xy}(X,Y)$ = $-\partial y/\partial x$ = $MU_X(x,y)/ MU_y(x,y)$
2x+3y	2	3	-2/3
4x+6y	4	6	-2/3
ax+by	a	b	-a/b
$2x^{1/2}+y$	$1/x^{1/2}$	1	$-1/x^{1/2}$
ln(x)+y	1/x	1	-1/x
v(x)+y	v'(x)	1	-v'(x)
xy	y	x	-y/x
$x^a y^b$	$ax^{a-1}y^b$	$bx^a y^{b-1}$	-ay/bx
(x+2)(y+1)	y+1	x+2	-(y+1)/(x+2)
(x+a)(y+b)	y+b	x+a	-(y+b)/(x+a)
x^a+y^a	ax^{a-1}	ay^{a-1}	$-(x/y)^{a-1}$

1. Cob-Douglas utility function is $U(x,y) = x^a y^b$. For Cob-Douglas utility function:
If $(a+b) < 1$ decreasing returns to scale
If $(a+b) > 1$ increasing returns to scale
If $(a+b) = 1$ constant returns to scale

Economists love to use the function $x^a y^{1-a}$ (which is constant returns to scale Cob-Douglas)

2. Any two utility functions which are monotonic increasing transformations describe the same preference relation

Examples

2.1 $U = XY$ and $U = 3XY - 10$ represent identical preferences

2.2 $U = X^a Y^b$ and $U = a\ lnX + b\ lnY$ represent identical preferences as well