In[76]:=
```
Clear[y]
(*Our utility fucntions is:*)
U = x * (y^2)
(*Notice that I could also solve for y to get a form that I could plot easily:*)
IC = Sqrt[Ubar / x]
```

Out[77]= $x\,y^2$

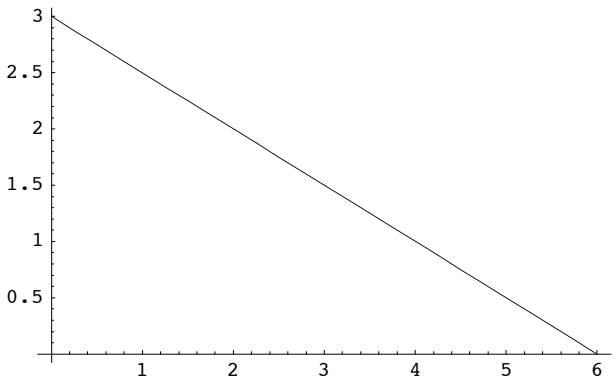
Out[78]= $\sqrt{\frac{Ubar}{x}}$

```
(*We can find the MRS using the formula from the
  handout.  (I will always give you the fucntion for the MRS for this class,
    since you are not required to know calculus.)  This function
  gives the slope of the indifference curve for any (x,y) pair.*)
MRS = D[U, x] / D[U, y]
```

Out[75]= $\frac{y}{2\,x}$

In[83]:=
```
(*We can plot our budget constraint,
 and also get the OC (slope of the budget constraint)*)
why = 3 - (1 / 2) x;
OC = D[why, x]
Plot[why, {x, 0, 6}, {AxesOrigin → {0, 0}}]
```

Out[84]= $-\frac{1}{2}$



Out[85]= - Graphics -

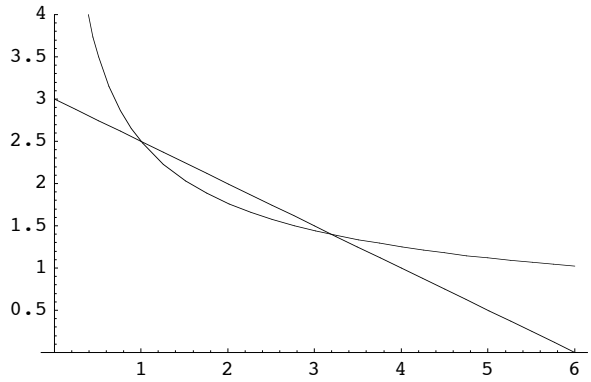
```
(*Let's add an indifference curve for the bundle (1, (5/2)).  First,
 we calcuate our level of utility for this bundle:*)
Uone = U /. {x → 1, y → (5 / 2)}
(*Then,
 we plug that fixed level of utility into our equation for the indiffernce curve:*)
ICone = IC /. Ubar -> Uone
(*Now, add that function to our graph*)
```

Out[91]= $\frac{25}{4}$

Out[92]= $\frac{5\sqrt{\frac{1}{x}}}{2}$

Out[93]= Plot

```
In[97]:= Plot[{why, ICone}, {x, 0, 6}, {AxesOrigin → {0, 0}}, PlotRange → {0, 4}]
```



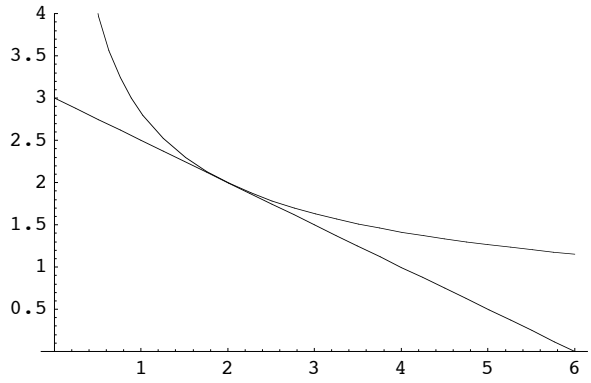
Out[97]= - Graphics -

```
(*Thinking back to our constrained optimization example,
 do you think this is the best I can do? Notice what happens
  when I plot the indifference curve for the optimal bundle:*)
```

```
In[101]:= Utwo = U /. {x → 2, y → (2)}
          (*Then, we plug that fixed level of
            utility into our equation for the indiffernce curve:*)
          ICtwo = IC /. Ubar -> Utwo
          (*Now, add that function to our graph*)
          Plot[{why, ICtwo}, {x, 0, 6}, {AxesOrigin → {0, 0}}, PlotRange → {0, 4}]
```

```
Out[101]= 8
```

$$\text{Out[102]=}\quad 2\sqrt{2}\,\sqrt{\frac{1}{x}}$$




```
Out[103]= - Graphics -
```