Let $f(x,y) = 2 - x^2$, $g(x,y) = \frac{2}{1+x^2+y^2}$ and $h(x,y) = 3x - 2y$.

1. Compute the gradient of each function.
2. Plot each gradient using the MATLAB code:

```
[x,y]=meshgrid(-5:1:5,-5:1:5);
U= x-component;
V= y-component;
quiver(x,y,U,V)
```

3. Construct $d\vec{\boldsymbol{r}}$ for each of the following curves:
   - $x^2 + y^2 = 9$ from $(3,0)$ to $(0,3)$.
   - $x = 2 + y^2$ from $(3,1)$ to $(6,2)$.
   - $6y - x = 5$ from $(1,1)$ to $(7,2)$.
4. In each case, integrate the gradient along its curve.
5. Do your answers make sense compared to the plots?