```
% Task 1. Homogeneous coordinates. (Pen & paper exercise) (1 point)

% Converting points:
% from cartesian -> homogeneous
% x1 = (2, -1) -> (2, -1, 1)
% x2 = (1, -2) -> (1, -2, 1)
% x3 = (1, 1) -> (1, 1, 1)
% x4 = (-1, 0) -> (-1, 0, 1)

x1 = [2; -1;  1]
```

```
x1 = 3×1
     2
    -1
     1
```

```
x2 = [1; -2; 1]
```

```
x2 = 3×1
     1
    -2
     1
```

```
x3 = [1; 1;  1]
```

```
x3 = 3×1
     1
     1
     1
```

```
x4 = [-1; 0; 1]
```

```
x4 = 3×1
    -1
     0
     1
```

```
% Line(ij) = point(i) x point(j) (Cross product)

l1 = cross(x1, x2)
```

```
l1 = 3×1
     1
    -1
    -3
```

```
l2 = cross(x3, x4)
```

```
l2 = 3×1
     1
    -2
     1
```

```
% point(kl) = Line(k) x Line(l) (Cross product)
x = cross(l1,l2)
```

```
x = 3×1
```

```
    -7
    -4
    -1
```

```
% Conversion back to Cartesian
% p = [u, v, w] -> (u/w, v/w)
% Therefore:

intersection_point = [x(1)/x(3), x(2)/x(3)]
```

```
intersection_point = 1×2
     7     4
```