

## MA205

### Solution for Problem Solving Lab 4

Mathematica code with equations of lines as limits of integration.

```

rho[x_, y_] := 3 x
na1[x_] := -4/3 x + 1.1
na2[x_] := 3/4 x + 0.475
nadt = Integrate[rho[x, y] dy dx, {x, 0, 3}, {y, 0, na1[x]}] +
Integrate[rho[x, y] dy dx, {x, 0.3, 1.1}, {y, 0, na2[x]}]
naxm = Integrate[x * rho[x, y] dy dx, {x, 0, 3}, {y, 0, na1[x]}] +
Integrate[x * rho[x, y] dy dx, {x, 0.3, 1.1}, {y, 0, na2[x]}];
naym = Integrate[y * rho[x, y] dy dx, {x, 0, 3}, {y, 0, na1[x]}] +
Integrate[y * rho[x, y] dy dx, {x, 0.3, 1.1}, {y, 0, na2[x]}];
comn = {naxm / nadt, naym / nadt}
sa[y_] := -Sqrt[0.16 - (y - .4)^2] + 1.1
sad = Integrate[rho[x, y] dx dy, {y, 0, 8}, {x, 0, sa[y]}]
saxm = Integrate[x * rho[x, y] dx dy, {y, 0, 8}, {x, 0, sa[y]}];
saym = Integrate[y * rho[x, y] dx dy, {y, 0, 8}, {x, 0, sa[y]}];
coms = {saxm / sad, saym / sad}

1.8885
{0.7731, 0.534114}
0.75062
{0.538118, 0.4}

```