In [33]:
```
import openpyxl
import math

book = openpyxl.open("1_Topliva.xlsx", read_only=True)
sheet = book.active
D = 500 * 10 ** -3
d = 20 * 10 ** -3
p = [i for i in range(3 * 10 ** 6, 7 * 10 ** 6 + 1, 8 * 10 ** 4)]
```

In [34]:
```
mSum = [[[] for j in range(10)] for i in range(10)]
sinAlpha = [[[] for j in range(10)] for i in range(10)]
for j in range(1, 10):
    mSum[0][j] = sheet[1][j].value
    sinAlpha[0][j] = sheet[1][j].value
    mSum[j][0] = sheet[1][j].value
    sinAlpha[j][0] = sheet[1][j].value
    for i in range(1, 10):
        if i != j:
            po_1 = sheet[6][j].value
            po_2 = sheet[6][i].value
            u_11 = sheet[7][j].value * 10 ** -3
            u_12 = sheet[7][i].value * 10 ** -3
            v_1 = sheet[8][j].value
            v_2 = sheet[8][i].value
            for p_k in p:
                sinA = (u_11 * (p_k / 98066.5) ** v_1) / (u_12 * (p_k / 98066.5) ** v_2)
                sinAlpha[i][j].append(sinA)
                m_1 = po_1 * u_12 * (p_k / 98066.5) ** v_2 * (math.pi / 4) * (D ** 2 - d ** 2)
                m_2 = po_2 * u_12 * (p_k / 98066.5) ** v_2 * (math.pi / 4) * d ** 2
                if sinA <= 1 and v_2 < v_1:
                    mSum[i][j].append(m_1 + m_2)
                else:
                    mSum[i][j] = []
                    break
```

In [35]:
```
book_write = openpyxl.Workbook()
sheet_write = book_write.active
s = 2
sheet_write.cell(row=1, column=1).value = "p"
for i in range(len(p)):
    sheet_write[i + 2][0].value = p[i] * 10 ** -6
for i in range(10):
    for j in range(10):
        if len(mSum[i][j]) == 51:
            sheet_write.cell(row=1, column=s).value = mSum[0][j] + "-" + mSum[i][0]
            for k in range(len(mSum[i][j])):
                sheet_write.cell(row=k + 2, column=s).value = mSum[i][j][k]
            s += 1
book_write.save("result.xlsx")
book_write.close()
```

In [36]:
```
import math
book_write = openpyxl.Workbook()
sheet_write = book_write.active
s = 2
sheet_write.cell(row=1, column=1).value = "p"
for i in range(len(p)):
    sheet_write[i + 2][0].value = p[i] * 10 ** -6
for i in range(10):
    for j in range(10):
        if len(sinAlpha[i][j]) == 51:
            sheet_write.cell(row=1, column=s).value = sinAlpha[0][j] + "-" + sinAlpha[i][0]
            for k in range(len(sinAlpha[i][j])):
                sheet_write.cell(row=k + 2, column=s).value = math.degrees(math.asin(sinAlpha[i][j][k]))
            s += 1
book_write.save("result_sin.xlsx")
book_write.close()
```