```python
total_students = 200
both = 50
prob_both = both / total_students
print(prob_both)
```

→ 0.25

```python
P_A = 0.6
P_B = 0.4
P_D_A = 0.05
P_D_B = 0.10

P_D = P_A * P_D_A + P_B * P_D_B
P_B_given_D = (P_B * P_D_B) / P_D
print(P_B_given_D)
```

→ 0.5714285714285715

```python
total = 6 + 4
oranges = 4
prob_orange = oranges / total
print(prob_orange)
```

→ 0.4

```python
P_condition = 0.01
P_no_condition = 0.99
P_pos_given_condition = 0.9
P_pos_given_no_condition = 0.1

P_pos = P_condition * P_pos_given_condition + P_no_condition * P_pos_given_no_condition
P_condition_given_pos = (P_condition * P_pos_given_condition) / P_pos
print(P_condition_given_pos)
```

→ 0.08333333333333333

```python
total_employees = 300
python = 180
java = 100
both = 50
prob = (python + java - both) / total_employees
print(prob)
```

→ 0.7666666666666667

```python
P_rain = 0.6
P_umbrella_given_rain = 0.9
P_rain_and_umbrella = P_rain * P_umbrella_given_rain
print(P_rain_and_umbrella)
```

→ 0.54

```python
P_pass = 0.7
P_study_given_pass = 0.8
# This is a direct conditional probability:
print(P_study_given_pass)
```

→ 0.8

```python
favorable = 6  # (1,6), (2,5), ..., (6,1)
total = 36
print(favorable / total)
```

```
0.16666666666666666
```

```python
total = 3 + 2 + 5
red = 3
green = 2
print((red + green) / total)
```

```
0.5
```

```python
P_public = 0.3
P_student_given_public = 0.6
P_student_and_public = P_public * P_student_given_public
print(P_student_and_public)
```

```
0.18
```

```python
tea = 0.4
coffee = 0.5
both = 0.2
prob = tea + coffee - both
print(prob)
```

```
0.7
```

```python
from math import comb
prob = comb(3, 2) * (0.5 ** 2) * (0.5)
print(prob)
```

```
0.375
```

```python
P_pos = 0.5
P_purchase_given_pos = 0.6
P_pos_and_purchase = P_pos * P_purchase_given_pos

# Assume purchase only comes from positive feedback
P_purchase = P_pos_and_purchase
P_pos_given_purchase = P_pos_and_purchase / P_purchase
print(P_pos_given_purchase)
```

```
1.0
```

```python
veg = 0.4
nonveg = 0.35
both = 0.2
print(veg + nonveg - both)
```

```
0.55
```

```python
total = 1000
both = 200
print(both / total)
```

```
0.2
```

```python
P_exercise = 0.6
P_lower_given_exercise = 0.9
P_lower_given_no_exercise = 0.1
P_no_exercise = 0.4

P_lower = (P_exercise * P_lower_given_exercise) + (P_no_exercise * P_lower_given_no_exercise)
print(P_lower)
```

```
0.5800000000000001
```

```python
total = 500
cs_only = 250
math_only = 100
both = 150
prob = (cs_only + math_only + both) / total
print(prob)
```

→ 1.0

```python
P_promotion_given_exceed = 0.5
print(P_promotion_given_exceed)
```

→ 0.5

```python
P_quiz = 0.25
P_share_given_quiz = 0.4
P_share = P_quiz * P_share_given_quiz
print(P_share)
```

→ 0.1

```python
smartphone = 0.6
tablet = 0.4
both = 0.25
print(smartphone + tablet - both)
```

→ 0.75

```python
P_visit = 0.7
P_purchase_given_visit = 0.5
print(P_visit * P_purchase_given_visit)
```

→ 0.35

```python
total = 1000
both = 500
print(both / total)
```

→ 0.5

```python
A = 0.5
B = 0.3
both = 0.2
print(A + B - both)
```

→ 0.6000000000000001

```python
math = 0.4
science = 0.3
both = 0.15
print(math + science - both)
```

→ 0.5499999999999999