## H1 (1/1 point)

1) Please calculate the number of positive integers which are smaller than 10000 and contain “1”

3439

3439

**Answer:** 3439

2) Please calculate the number of positive integers which are smaller than 10000 and contain “0”

2619

2619

**Answer:** 2619

**EXPLANATION**

1）Solution 1：Smaller than 10000, the positive interger which does not contain ‘1’ can be seen as a 4 digit number, except 0000. Therefore, there is 9×9×9×9－1＝6560. Therefore, those numbers which contains ‘1’ is：9999－6560=3439,

Solution 2: The number of all 4 digit number are $10^4$, the 4 digit number which does not contain 1 is $9^4$, the 4 digit number which contains 1 is the difference between the two: $10^4-9^4$ = 3439

2）"Contain 0” and“Contain 1” are not same with each other, for example ‘0019’ contains ‘1’ but does not contain ‘0’ in format of natural numbers. You may need to pay attention on that, in the combination exercise, it contains similar kinds of implicit rules you may need to pay attention to.

1 digit number which does not contain ‘0’ is 9 of them, 2 digit numbers we have $9^2$, 3 digit number we have $9^3$, 4 digit number contains $9^4$, the positive number which is smaller than 1000 that does not contains 0 contains: $9 + 9^2 + 9^3 + 9^4 = (9^5 - 1)/(9-1)$=7380. Therefore, the positive number which is smaller than 10000 that contains ‘0’ is: 9999－7380=2619

Final Check | Save | Hide Answer *You have used 2 of 3 submissions*

## H2 (2/2 points)

Find the number of shortest path from O to P

1) If the path must pass through point A

560

560

**Answer:** 560

2) If the path must pass through path AB

350

350

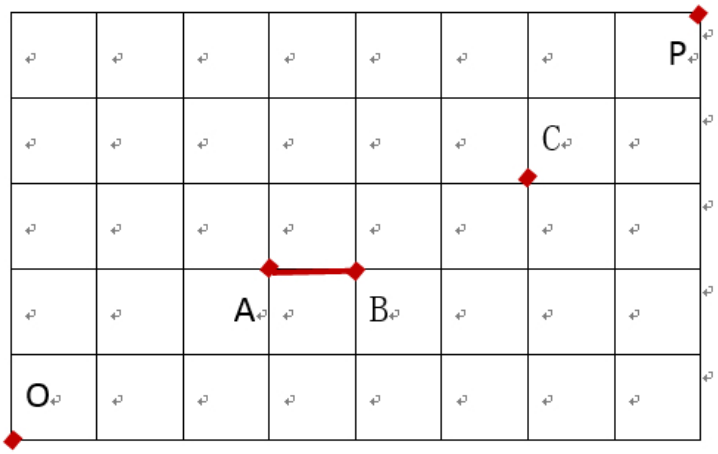
**Answer:** 350

3) If the path must pass through point A and point C

240

240

**Answer:** 240




**EXPLANATION**

1) Complete in 2 steps O(0,0)->A(3,2), A(3,2)->P(8,5); according to multiplication rules：

C(3+2,2)*C(3+5,3)=560

2）Complete in 2 steps O(0,0)->A(3,2),B(4,2)->P(8,5), according to multiplication rules：

C(3+2,2)*C(3+4,3)=350

3） Complete in 3 steps：O(0,0)->A(3,2),A(3,2)->C(6,3),C(6,3)->P(8,5),

According to multiplication rules,

C(3+2,2)*C(3+1,1)*C(2+2,2)=240

Check Save Hide Answer *You have used 1 of 5 submissions*

H3 (1/1 point)

For the case of giving fruits to 3 children, in total there are 12 identical apples, each child may at least have a fruit, it contains ____ types of ways.

55

55

**Answer:** 55

**[EXPLANATION]**

Set the fruit giving away for ith child as
$x_i, x_i \geq 1, x_1 + x_2 + x_3 = 12, let y_1 = x_1 - 1, y_2 = x_2 - 1, y_3 = x_3 - 1, y_1 + y_2 + y_3 = 9, y_i \leq 0$The non-negative integer solution number is C(9+3-1,9)=55。

Think About：The number of non-negative integer solution number of$x_1 + x_2 + x_3 = 12, and x_1 \leq 5, x_2 \leq 8, x_3 \leq 5$

Final Check | Save | Hide Answer | *You have used 1 of 2 submissions*

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