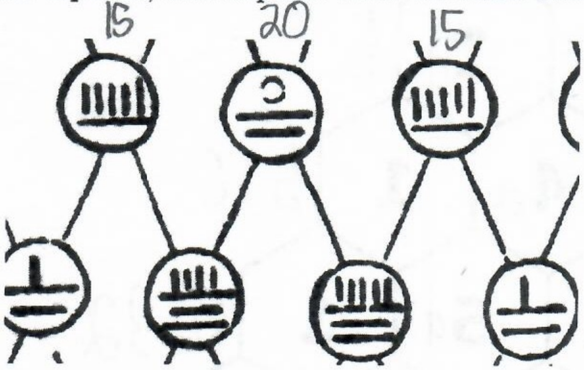
1. (2pts) Here is the 10th row of Pascal's triangle; fill in the 11th row below it.

	1		10		45		120		210		252		210		120		45		10		1	
1		11		55		165		330		462		462		330		165		55		11		1

2. (2pts) What is particularly interesting about this portion of Yanghui's triangle? Translate the numbers in the top row, and explain what we learn about the Chinese bamboo rod number patterns.



Each of the top two pairs add up to make the next number in between them in the row below

One say 34 and one says 35 which isn't symmetrical like the rest of the triangle.

3. (2pts) You and your roommate are going to split 10 luscious chocolates (five each) from a fancy box, where each candy is different. You get to go first – lucky you! In how many ways can you choose your five different chocolates? Show how Pascal's triangle gives the answer.

good

$C_5^{10} = \frac{10!}{5!(10-5)!} = \boxed{252 \text{ ways}}$

I can use the triangle to get the answer by going to the 10th row and 5 over in the row would be 252.

1. (2pts) Here is the 10th row of Pascal's triangle; fill in the 11th row below it.

	1		10		45		120		210		252		210		120		45		10		1	
1		11		55		165		330		462		462		330		165		55		11		1

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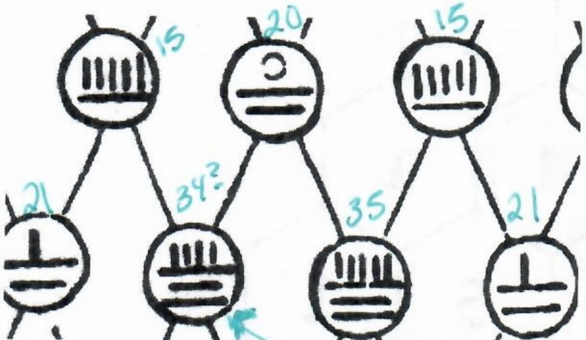


There is a mistake here. The answer should be 35 to keep the rule + the symmetry.

The vertical rods signify ones. The horizontal signify tens. The vertical above the horizontal signify ones added to tens. The o above the horizontal rods signifies a zero in the ones place in addition to the tens.

3. (2pts) You and your roommate are going to split 10 luscious chocolates (five each) from a fancy box, where each candy is different. You get to go first – lucky you! In how many ways can you choose your five different chocolates? Show how Pascal's triangle gives the answer.

C^{10}_{5} $\quad \frac{10!}{5!(10-5)!} \quad \frac{10!}{5!\,5!} \quad \frac{10\cdot9\cdot8\cdot7\cdot6\cdot\cancel{5!}}{5!\,\cancel{5!}} \quad \frac{10\cdot9\cdot8\cdot7\cdot6}{5\cdot4\cdot3\cdot2\cdot1}$

$\frac{30240}{120} \quad \frac{252}{1} = 252$

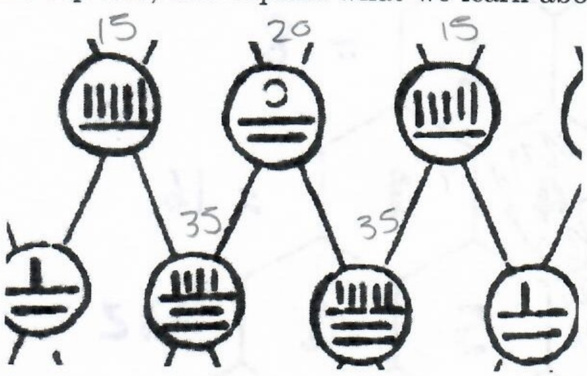
And now I see it in the chart above, too. :)

1. (2pts) Here is the 10th row of Pascal's triangle; fill in the 11th row below it.

	1		10		45		120		210		252		210		120		45		10		1	
1		11		55		165		330		462		462		330		165		55		11		1

✓

2. (2pts) What is particularly interesting about this portion of Yanghui's triangle? Translate the numbers in the top row, and explain what we learn about the Chinese bamboo rod number patterns.



We notice the uses of different Pattern in the writing alongside the Symmetry.

How 20 is two lines = (possibly 10 each) but topped with a ○ to represent that the number isn't something else.

Also a mistake was made in the left 35. It counts up to 34 by marking when it's meant to be 35.

✓

3. (2pts) You and your roommate are going to split 10 luscious chocolates (five each) from a fancy box, where each candy is different. You get to go first – lucky you! In how many ways can you choose your five different chocolates? Show how Pascal's triangle gives the answer.

Go down to the 10th row in pascals triangle, and inward to the 5th space you'll find the number 252.

great

$$^{10}C_5 = \frac{10!}{5!(10-5)!}$$

$$\frac{10\cdot 9\cdot 8\cdot 7\cdot 6\cdot \cancel{5}\cdot \cancel{4}\cdot \cancel{3}\cdot \cancel{2}\cdot \cancel{1}}{5\cdot 4\cdot 3\cdot 2\cdot 1\cdot \cancel{5}\cdot \cancel{4}\cdot \cancel{3}\cdot \cancel{2}\cdot \cancel{1}}$$

$$\frac{30,240}{120} = 252$$

(just wanted to proof check)

good

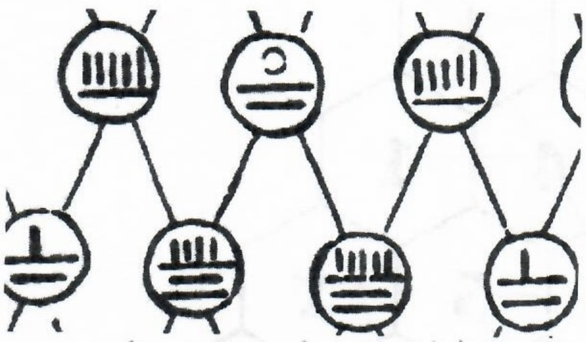
✓

1. (2pts) Here is the 10th row of Pascal's triangle; fill in the 11th row below it.

	1		10		45		120		210		252		210		120		45		10		1	
1		11		55		165		330		462		462		330		165		55		11		1

✓

2. (2pts) What is particularly interesting about this portion of Yanghui's triangle? Translate the numbers in the top row, and explain what we learn about the Chinese bamboo rod number patterns.



15 20 15

What is interesting about this portion is that there is an addition error in the second row where the maker of this triangle wrote 34 instead of 35. We learn that each vertical line indicates one so when we have ||||| we actually have 5. We also learn that each horizontal line is a ten so $\overset{\circ}{=}$ is 20 and $\overset{|||}{=}$ is 23 etc. 6 thru 9 are interesting because they contain vertical and horizontal lines but they are connected. 6 is $\perp$ 7 is $\perp\!\!\perp$ etc.

✓

3. (2pts) You and your roommate are going to split 10 luscious chocolates (five each) from a fancy box, where each candy is different. You get to go first – lucky you! In how many ways can you choose your five different chocolates? Show how Pascal's triangle gives the answer.

$C^{10}_{5} = \frac{10!}{5!(10-5)!} = \frac{10\cdot9\cdot8\cdot7\cdot6\cdot\cancel{5}\cdot\cancel{4}\cdot\cancel{3}\cdot\cancel{2}\cdot\cancel{1}}{5\cdot4\cdot3\cdot2\cdot\cancel{1}\cdot\cancel{5}\cdot\cancel{4}\cdot\cancel{3}\cdot\cancel{2}\cdot\cancel{1}} = \frac{30240}{120} = 252$ ways to choose

✓

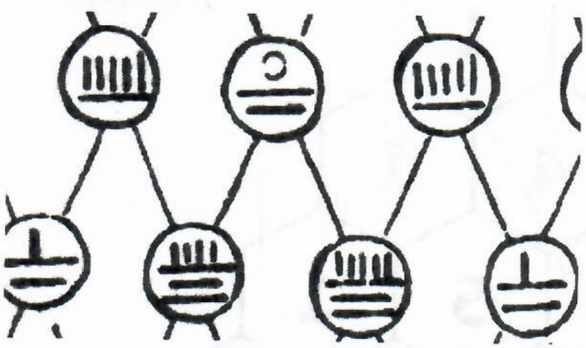
$C^{10}_{0}\ C^{10}_{1}\ C^{10}_{2}\ C^{10}_{3}\ C^{10}_{4}\ C^{10}_{5}\ C^{10}_{6}\ C^{10}_{7}\ C^{10}_{8}\ C^{10}_{9}\ C^{10}_{10}$ - tenth row of Pascal's triangle as it applies here

good

1. (2pts) Here is the 10th row of Pascal's triangle; fill in the 11th row below it.

	1		10		45		120		210		252		210		120		45		10		1	
1		11		55		165		330		462		462		330		165		55		11		1

2. (2pts) What is particularly interesting about this portion of Yanghui's triangle? Translate the numbers in the top row, and explain what we learn about the Chinese bamboo rod number patterns.



The particularly interesting part in this portion is that there seems to be an error. The two numbers at the bottom should be the same and the numbers connected to them should add up, but here this isn't the case.

The numbers on the top row are 15 20 15.
We learn that a vertical line on top of a horizontal line translates to the number of horizontal lines being the 10's place, and the number of vertical lines on top being the 1's place. (III ← 3 vertical lines, = ← 2 horizontal lines = 23)

3. (2pts) You and your roommate are going to split 10 luscious chocolates (five each) from a fancy box, where each candy is different. You get to go first – lucky you! In how many ways can you choose your five different chocolates? Show how Pascal's triangle gives the answer.

$$C_5^{10} = \frac{10!}{5!(10-5)!} = 252$$

The 5 of the 10th row is 252

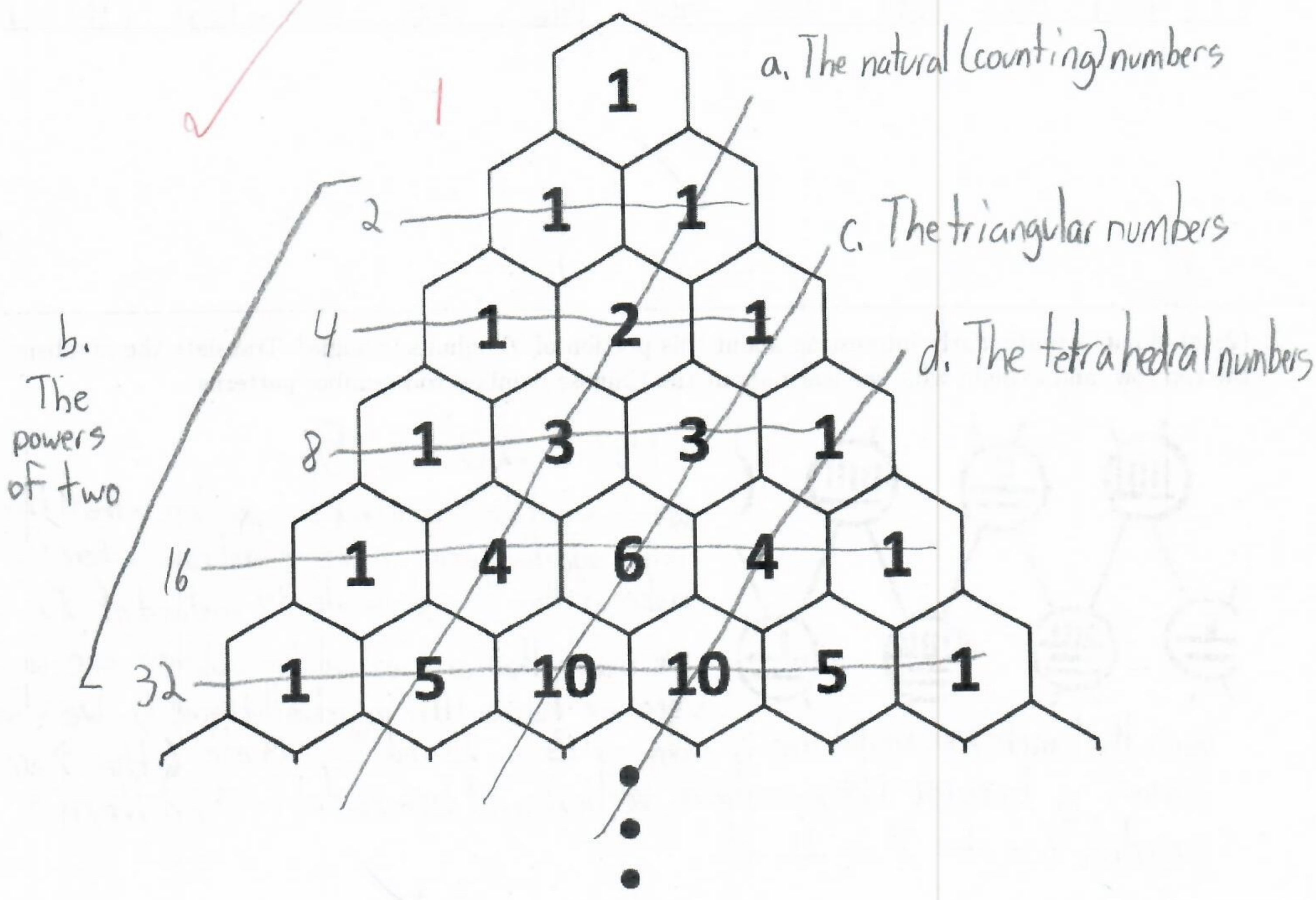
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1

C_0^{10} C_1^{10} C_2^{10} C_3^{10} C_4^{10} C_5^{10} C_6^{10} C_7^{10}

→ 252

4. (4pts) Use this version of Pascal's triangle to illustrate where the following sets of numbers appear in the triangle, in a **systematic** way:

   a. The natural (counting) numbers
   b. The powers of two
   c. The triangular numbers
   d. The tetrahedral numbers



4. (4pts) Use this version of Pascal's triangle to illustrate where the following sets of numbers appear in the triangle, in a **systematic** way:

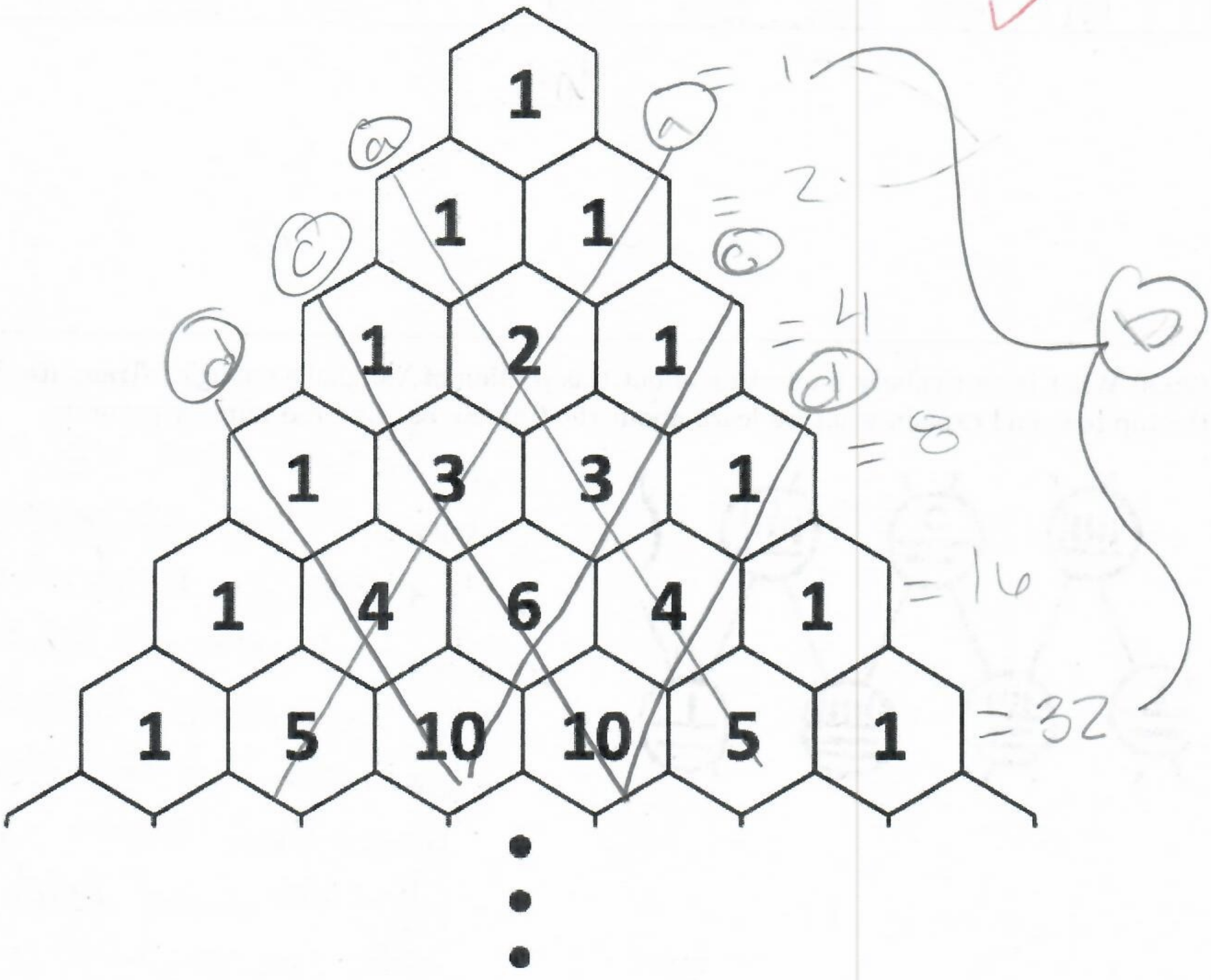
a. The natural (counting) numbers line(s) of 1, 2, 3, 4, 5

b. The powers of two how much each row =

c. The triangular numbers line(s) of 1, 3, 6, 10

d. The tetrahedral numbers line(s) of 1, 4, 10

good ✓



4. (4pts) Use this version of Pascal's triangle to illustrate where the following sets of numbers appear in the triangle, in a **systematic** way:

   a. The natural (counting) numbers
   b. The powers of two
   c. The triangular numbers
   d. The tetrahedral numbers

Nice