If we count by 3's starting with 1, the following sequence is obtained: 1, 4, 7, 10, ..., what is the 100th number in this sequence?	In a group of 33 high school students, 10 take french, 11 take Spanish, and 5 take both languages. How many students of the group take neither French nor Spanish?
What is the smallest natural number that is both a perfect square and a perfect cube? What is the next smallest number?	If the probability of making a free throw in basketball is 40 percent, what is the most likely number of points you will make in a "bonus" free throw? (With a bonus free throw, you shoot one free throw and get one additional free throw if you make the first one.) What if the probability of making a free throw is 80%?

Answer all four questions.

If we count by 3's starting with 1, the following sequence is obtained: 1, 4, 7, 10, ..., what is the 100th number in this sequence?

1, 4, 7, 10, 13, 16, 19, 22

n	y
1	1
2	4
3	7
4	10
n	3n - 2
100	298

+1 +1 +1 +3 +3 +3

o e o e

100th is going to be even.

$3n - 2$

$3(100) - 2$

$300 - 2$

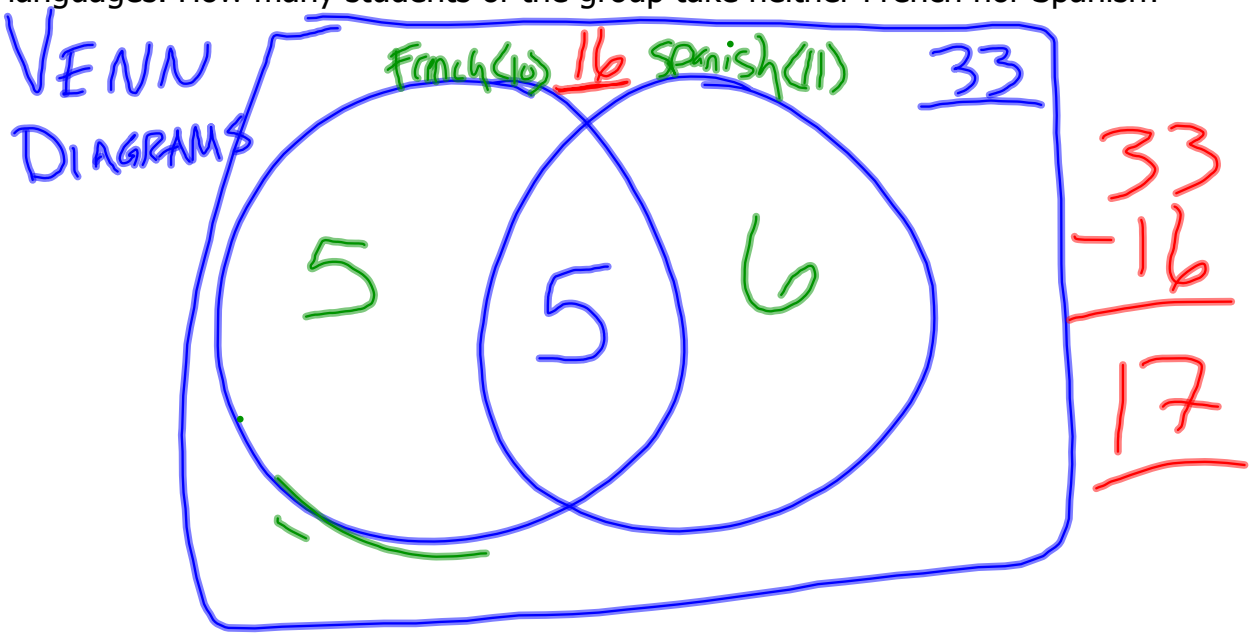
298

Find the 50th #

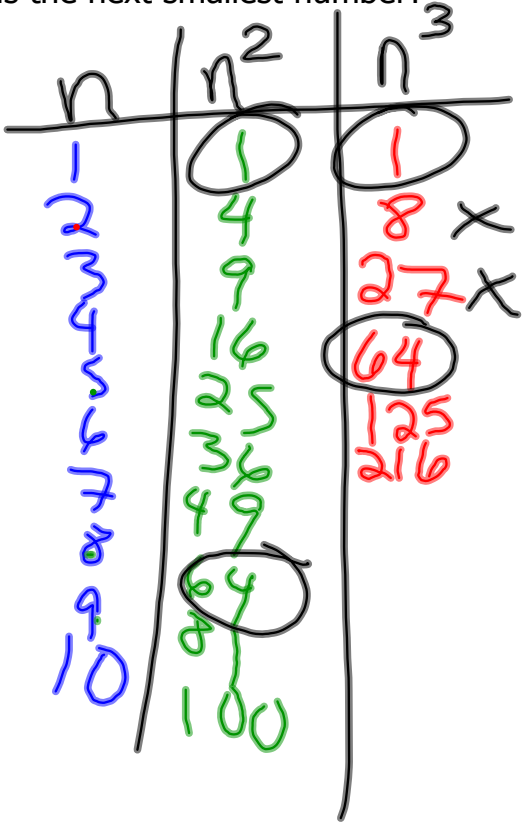
1	3
2	8
3	13
n	5n - 2
50	5(50) - 2 = 248

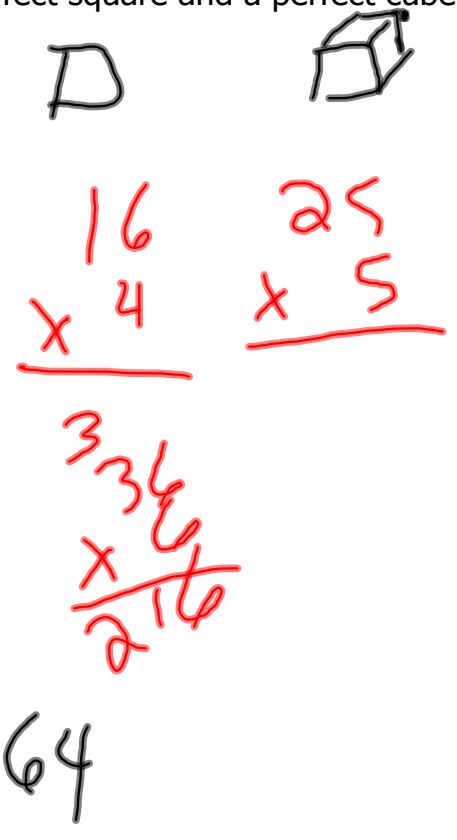
+1 +1 +5 +5

In a group of 33 high school students, 10 take french, 11 take Spanish, and 5 take both languages. How many students of the group take neither French nor Spanish?

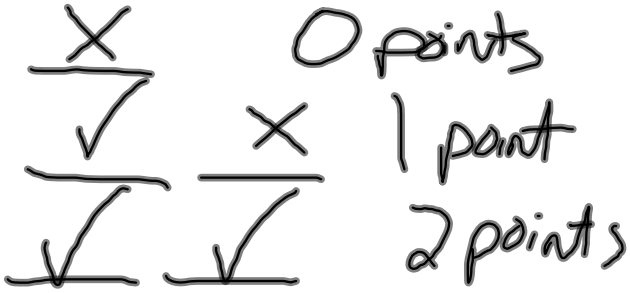


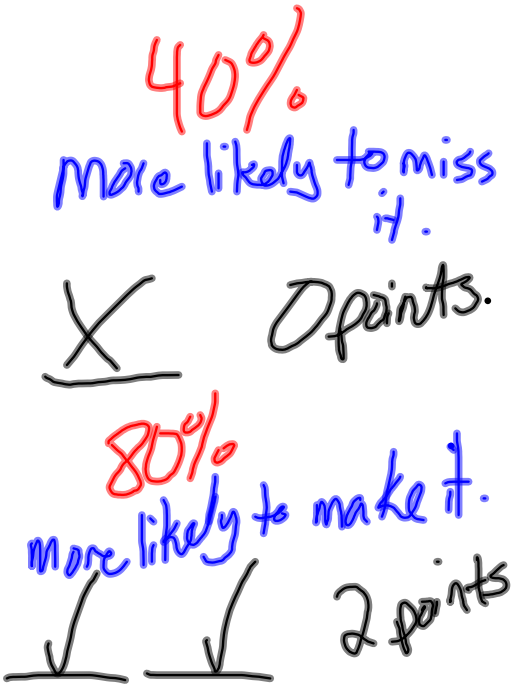
What is the smallest natural number that is both a perfect square and a perfect cube?
What is the next smallest number?





If the probability of making a free throw in basketball is 40 percent, what is the most likely number of points you will make in a "bonus" free throw? (With a bonus free throw, you shoot one free throw and get one additional free throw if you make the first one.) What if the probability of making a free throw is 80%?





1. Restate the Question You should write the question in your own words, showing that you understand what the question was asking.	**2. Solution** State your solution, and the steps you took to coming to this solution. This should be the process you took to solving the problem, providing details on what steps were taken, and how you did it.
3. Picture Draw a picture that explains how you solved the problem. The picture should be clear enough that someone can look at it, and know exactly what your thinking was in solving the problem.	**4. Similar Problem/Connection** Write a similar problem (different numbers), alternative solution (different way to solve the problem), or a connection to something you have experienced or have learned before. Be sure to include the new solution and new picture, or details of how the experience connects with this problem.

1. The question is asking_____(restate question)_____.

2. The solution is _____(state solution in correct unit of measure)

3. I solved this problem by_____.
Then,_____.
Then,_____.
And finally. _____
(Explain your method/strategy and how you figured your solution)

4. The picture below helps to explain the problem and solution.
The _____demonstrates_____. (Draw pictures to describe your solution. Be sure someone can understand the solution if they look at your picture and labels.)

5 .A similar problem could be _____.
(Create a similar problem. Be sure to include your solution, explanation of solution and picture to describe your solution.)

Communication Entry Rubric

4 Strong communication - The reader is engaged by the writer's mathematical thinking and exceptional insights. The author knows how to solve the problem correctly.

- Thinking is clearly explained in an organized way.
- There is adequate development of the concept using appropriate details.
- Appropriate mathematical language is used as necessary.
- A picture or chart supports the written ideas.
- The writer shows understanding of the concept by making connections to other knowledge (a similar problem, another branch of mathematics, or a realistic situation). The connection is fully developed with supporting details.

3 Good Communication - The reader understands the writer's response. The author knows how to solve the problem correctly.

- Thinking is clearly explained in an organized way.
- There is adequate development of the concept using appropriate details.
- Acceptable vocabulary is used.
- A picture or chart supports the written ideas.
- The writer shows understanding of the concept. Minor errors may exist that have little effect on the communication of the ideas discussed. A connection may be made but is not fully developed with supporting details.

2 Weak communication - The reader has difficulty understanding the procedure followed or the author's ideas. The reader is not convinced the author knows how to solve the problem.

- Organization is difficult to follow.
- Details are lacking.
- Mathematical vocabulary is not used when it can be.
- There is no picture or the picture does not support the written ideas.
- The author does not convince the reader that the concept is understood. There are few details to support the author's thinking. There is no connection.

1 Undeveloped communication - Too brief to evaluate whether or not the author understood the concept.

- There is no organization.
- No mathematical vocabulary is used.
- There is no picture.
- The explanation is too short to know whether or not the concept is understood. There are little or no details to support the author's thinking. There is no connection.

Does It Matter Which Winner You Saw?

Scenario: Students at your school have just finished competing in the qualifying round of a nationally sponsored contest on mathematical reasoning and sense making. When the work was scored, it turned out that four students at your school all had perfect preliminary papers—two girls and two boys. The school decided to hold a random drawing among these four students to select two of them to send to the national finals. The drawing takes place in the school auditorium. You show up late to the drawing, just as one of the winners—a girl—is leaving the stage amid cheers.

- Suppose that the girl that you saw leaving the stage is the first winner. What is the probability that the second winner will also be a girl?
- Suppose that the girl that you saw leaving the stage was the second winner. What is the probability that the first winner was also a girl?

P second is a girl $\frac{1}{3}$

P first is a girl $\frac{2}{4} = \frac{1}{2}$

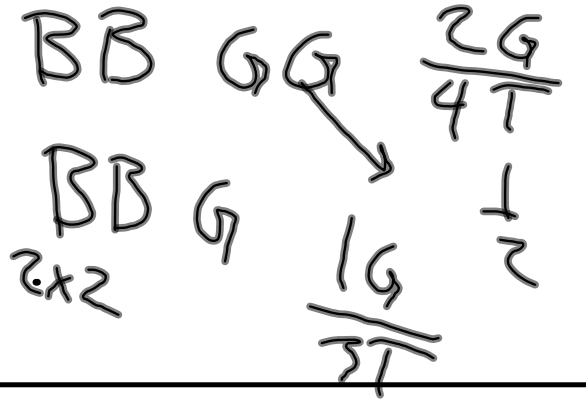
1. Restate the Question

What is the probability that the second choice is a girl if I saw the first one was a girl? What is the prob. that the first was a girl if I saw the second was a girl?

2. Solution

The prob 2nd was a girl is $\frac{1}{3}$ because after the first girl is chosen there is 1 girl left and 3 total. The prob. 1st was a girl is $\frac{1}{2}$ because there is 2 girls, 4 total.

3. Picture



4. Similar Problem/Connection

What is the prob. if there are 3 girls & 3 boys.. $\frac{3}{6} = \frac{1}{2}$

$\frac{2}{5}$

1. Restate the Question	2. Solution
For a competition, two students will be drawn from random. There are two girls and two boys. What is the probability that the second is a girl if the girl you see chosen was the first one selected? What is the probability that the first is a girl if the girl you see chosen is the second one selected?	If the girl I saw was the first chosen, the probability that the second is a girl is 1/3. If the girl I saw was the second one chosen, the probability that the first was a girl is 1/2. If the first chosen was a girl, then there are three students left to chose from, and only one of them is a girl. This makes the probability, one girl out of three total. If the second one chosen is a girl, the probability that the first is a girl is 1/2 because in the first selection there are two girls out of four total, which reduces to 1/2.
3. Picture  1 Girl, 3 total 1/3 2 Girls, 4 total 2/4 = 1/2	**4. Similar Problem/Connection** A similar problem would be if there were 3 green marbles and 3 blue marbles, what would the probability be that the second marble is green, if you already selected one green marble. What is the probability that the first marble is green, if the second one chosen is green. [Provide solutions]

1. The question is asking_____(restate question)_____.

2. The solution is _____(state solution in correct unit of measure)

3. I solved this problem by_____.
Then,_____.
Then,_____.
And finally. _____
(Explain your method/strategy and how you figured your solution)

4. The picture below helps to explain the problem and solution.
The _____demonstrates_____. (Draw pictures to describe your solution. Be sure someone can understand the solution if they look at your picture and labels.)

5 .A similar problem could be _____.
(Create a similar problem. Be sure to include your solution, explanation of solution and picture to describe your solution.)

When given 2 boys and 2 girls, what is the probability that the second choice is a girl, if I said the first one was a girl?

The answer was $\frac{1}{3}$ because