2005 Washington State Math Championship

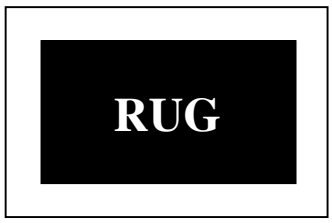
Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

Probability - Grade 5

1. What is the probability of NOT choosing a prime number from the first 25 integers?

2. How many ways can 5 true/false questions be answered?

3. *Spilled Ice Cream Problem* Chris Cross is 13 months old, and is at the prime age to learn to walk. He zigzags across the 12 by 15 foot room shown in the figure, eventually falling down. The ice cream cone he is carrying spills either on the 9 by 12 foot rug or on the floor around the rug. What is the probability the ice cream will land on the floor?



4. A single card is drawn from a deck of cards. What is the probability it is a face card? Write your answer as a reduced fraction.

5. A pizza establishment offers 12 kinds of meat topping (pepperoni, sausage, etc.) and 5 kinds of vegetable toppings (onions, peppers, etc). How many different two topping pizzas can be made using a combination of 1 meat topping and 1 vegetable topping?

6. Find the **mean** ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6. Give your answer rounded to the nearest tenth of a week.

7. Find the **median** ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6. Round your answer to the nearest tenth of a week.

8. Find the **range** for the ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6

9. Triangles are usually named by placing a **different** letter at each vertex. In how many different ways could a given triangle be named?

10. Charlie brown has 13 socks in his drawer, 7 blue and 6 green. He selects 5 socks at random. What is the probability he gets 2 blue and 1 green?

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Probability - Grade 6

1. A single card is drawn from a deck of cards. What is the probability it is a face card? Write your answer as a reduced fraction.

2. A pizza establishment offers 12 kinds of meat topping (pepperoni, sausage, etc.) and 5 kinds of vegetable toppings (onions, peppers, etc). How many different two topping pizzas can be made using a combination of 1 meat topping and 1 vegetable topping?

3. Find the **mean** ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6. Give your answer rounded to the nearest tenth of a week.

4. Find the **median** ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6. Round your answer to the nearest tenth of a week.

5. Find the **range** for the ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6

6. Triangles are usually named by placing a **different** letter at each vertex. In how many different ways could a given triangle be named?

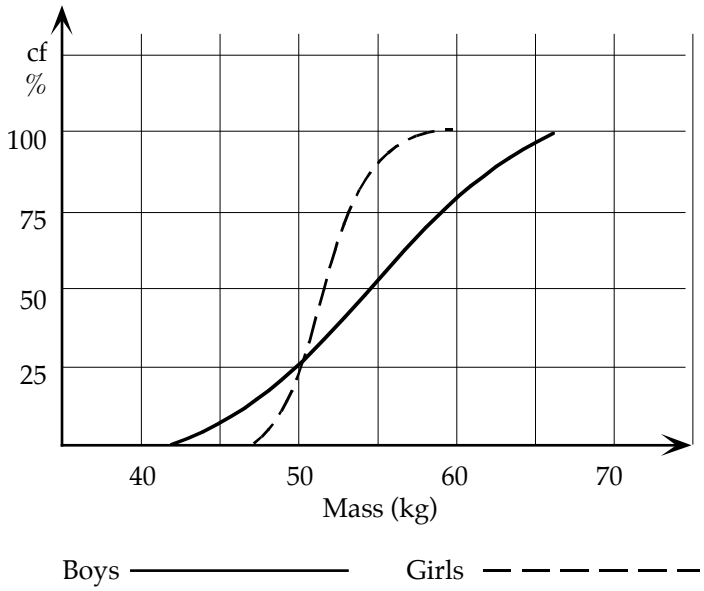
7. Charlie brown has 13 socks in his drawer, 7 blue and 6 green. He selects 5 socks at random. What is the probability he gets 2 blue and 1 green?

8. The table below shows the frequency of the number of dental fillings for a group of children.

Number of Fillings	0	1	2	3	4	5
Frequency	4	3	8	5	4	1

If this is typical, and you are a typical person, what is the probability that you would have one or fewer cavities?

9. The diagram shows the graphs of the cumulative frequency distributions of the masses of random samples of boys and girls in a school.



Use the information contained in the diagram to find the median mass of the sample of boys.

10. A two-digit number is chosen at random, 10 to 99. What is the probability that it is divisible by 8? Write your answer as a reduced fraction.

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Probability - Grade 7

1. Find the **median** ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6. Round your answer to the nearest tenth of a week.

2. Find the **range** for the ages in weeks of puppies at an animal shelter. The ages are 4, 7, 6, 13, 15, 13, 8, 11, 11, 17, 5, 6

3. Triangles are usually named by placing a **different** letter at each vertex. In how many different ways could a given triangle be named?

4. Charlie brown has 13 socks in his drawer, 7 blue and 6 green. He selects 5 socks at random. What is the probability he gets 2 blue and 1 green?

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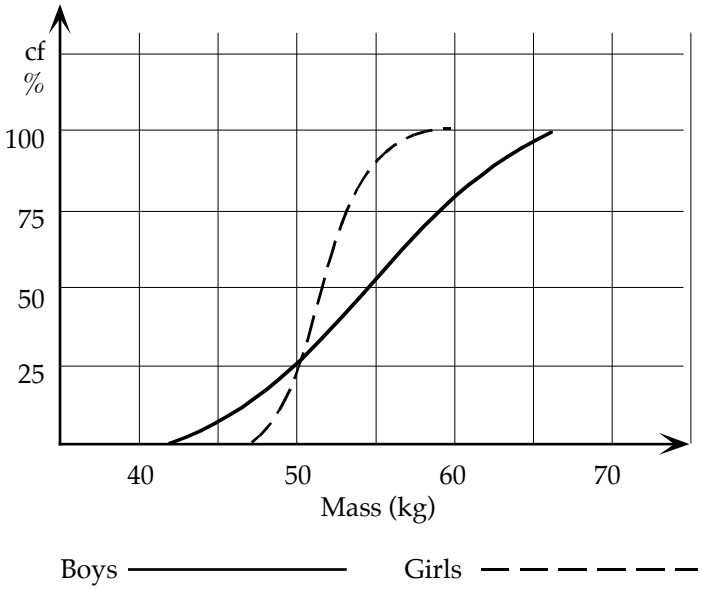
If this is typical, and you are a typical person, what is the probability that you would have one or fewer cavities?

6. The diagram shows the graphs of the cumulative frequency distributions of the masses of random samples of boys and girls in a school.



Use the information contained in the diagram to find the median mass of the sample of boys.

7. A two-digit number is chosen at random, 10 to 99. What is the probability that it is divisible by 8? Write your answer as a reduced fraction.

8. The refreshment served by an airline consists of wine, cheese and biscuits. During one flight, 30 passengers were served. One had wine only, 1 had cheese only, and 4 had biscuits only. Five had both wine and cheese but not biscuits, 6 had wine and biscuits but not cheese, 7 had cheese and biscuits but not wine, and the remaining passengers had all three. How many passengers had all three items?

9. In an examination, the mean score obtained by 10 students was 6 and the mode was 5. The scores for the 10 students were {6, 9, 5, 8, 6, 7, 5, 8, a, b}, where b was a larger score than a. Calculate a + b.

10. The table displays the frequency of scores in a competition. The mean score is 15. Find *k*.

Score	12	13	14	15	16	17
Frequency	2	4	7	13	*k*	5

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Probability - Grade 8

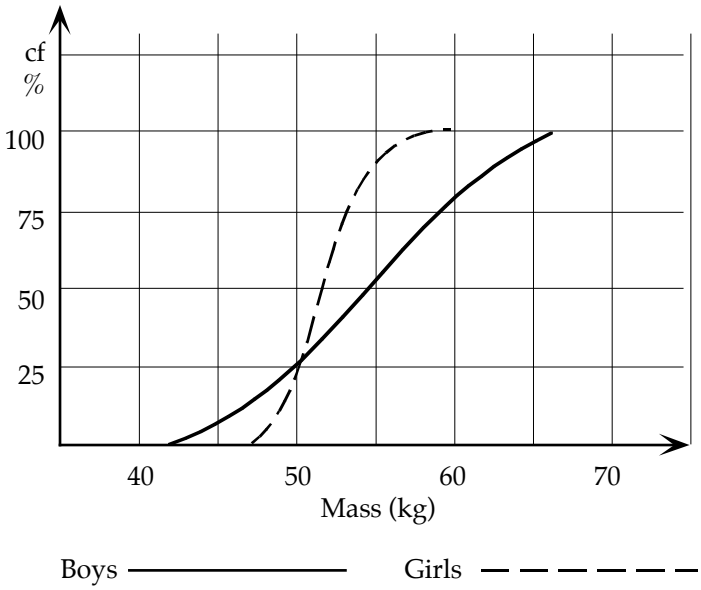
1. Charlie brown has 13 socks in his drawer, 7 blue and 6 green. He selects 5 socks at random. What is the probability he gets 2 blue and 1 green?

2. The table below shows the frequency of the number of dental fillings for a group of children.

Number of Fillings	0	1	2	3	4	5
Frequency	4	3	8	5	4	1

   If this is typical, and you are a typical person, what is the probability that you would have one or fewer cavities?

3. The diagram shows the graphs of the cumulative frequency distributions of the masses of random samples of boys and girls in a school.



   Use the information contained in the diagram to find the median mass of the sample of boys.

4. A two-digit number is chosen at random, 10 to 99. What is the probability that it is divisible by 8? Write your answer as a reduced fraction.

5. The refreshment served by an airline consists of wine, cheese and biscuits. During one flight, 30 passengers were served. One had wine only, 1 had cheese only, and 4 had biscuits only. Five had both wine and cheese but not biscuits, 6 had wine and biscuits but not cheese, 7 had cheese and biscuits but not wine, and the remaining passengers had all three. How many passengers had all three items?

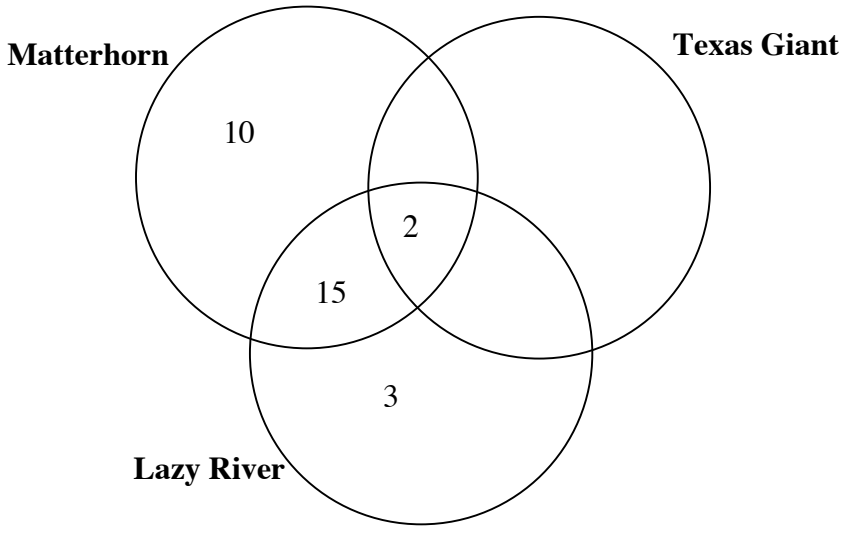
6. In an examination, the mean score obtained by 10 students was 6 and the mode was 5. The scores for the 10 students were {6, 9, 5, 8, 6, 7, 5, 8, a, b}, where b was a larger score than a. Calculate a + b.

7. The table displays the frequency of scores in a competition. The mean score is 15. Find *k*.

Score	12	13	14	15	16	17
Frequency	2	4	7	13	*k*	5

8. The mean height of a group of students is 181 cm. Another student whose height is 163 cm joins the group, and the mean height is reduced to 179 cm. What is the number in the original group?

9. A group of 100 students went to the amusement park for physics day. Three of the possible rides were the Matterhorn, Lazy River and the Texas Giant. 40 of the students rode the Matterhorn. 40 rode the Texas Giant and 20 rode Lazy River. Some of the information is indicated in the **partially completed** Venn diagram below.



What is the probability a randomly selected student rode only the Texas Giant?

10. Four boys and four girls sit around a merry-go-round. How many different ways could they be arranged if the boys and the girls sit alternately around the merry-go-round?

Probability Problems 2005 – Answers

1. $\frac{16}{25} = .64 = 64\%$
2. 32
3. $\frac{2}{5} = .40 = 40\%$
4. $\frac{3}{13}$
5. 60
6. 9.7 weeks
7. 9.5
8. 13
9. 15600
10. $\frac{1225}{3432} \approx .3569 = 35.69\%$
11. $\frac{7}{25} = .28 = 28\%$
12. **Any value from 53 to 55**
13. $\frac{11}{90}$
14. 6
15. 6
16. $k = 11$
17. 8 people
18. $\frac{1}{4} = .25 = 25\%$
19. 144