

Name: _____

Start date: _____


Hand in date: _____

Mark: _____

Math 8 K&E

Probability

Probability

Unit: Spreadsheets and Databases	I Can	Do 
1. Gather and organize information	I can understand the vocabulary in this unit.	Split Page Vocabulary pp. 181–182
2. Examine and discuss probability		
3. Complete experiments on probability	I can read a bar graph. I can read a broken line graph. I can read a circle graph. I can tell you how to find mean, mode, median, and range. I can tell you about outcomes in probability.	Practice: pp. 183–208 Mathpower 8: p. 315 (3–4) Practice: p. 203 Mathpower 8: p. 334 (7–15, odd numbers) Practice: pp. 204–208



Practice: Split Page Vocabulary

1 of 2

Directions:

Fill in the definition for each word below. Use your textbook or a dictionary to help you find the meaning of the word. Show you understand by including a picture or example of each word.

Term	Definition	Picture/Example
Biased Sample		
Bar Graph		
Biased Answer		
Broken Line Graph		
Census		
Circle Graph		
Data		
Database		
Frequency		



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Practice: Split Page Vocabulary

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Directions:

Fill in the definition for each word below. Use your textbook or a dictionary to help you find the meaning of the word. Show you understand by including a picture or example of each word.

Term	Definition	Picture/Example
Pictograph		
Poll		
Population		
Random Sample		
Sample		
Stratified Sample		
Survey		
Tally		



Practice: Probability Unit

Example 1:

There are about 10 000 people 12 years of age or older in Greenville. Francine conducted a survey to predict how often they go to the movies in a year. She chose 50 people for her sample and used a telephone survey. Use the results of Francine's survey to predict how often the people of Greenville go to the movies.

Survey Sheet	
Movies per year	Tally
0	
1 to 4	
5 to 8	
9 to 12	
13 or more	

Step #1 – Total the tallies for each category and write each total as a percent of the people surveyed.

Movies per year	Tally totals	Frequency	Fraction	Percent
0		21	$\frac{21}{50}$	42%
1 to 4				
5 to 8				
9 to 12				
13 or more				



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Practice: Probability Unit

Step #2 – Apply the percents to the 10 000 people of Greenville in order to make a prediction.

Movies per year	Percent	Number of people
0	42%	42% of 10 000 = $.42 \times 10\,000$ = 4200
1 to 4		
5 to 8		
9 to 12		
13 or more		

Conclusion:

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Practice: Probability Unit

Example 2:

A grade 8 class collected the following lunchroom waste over 5 days.

Fruit scraps: 20 kg

Food scraps: 15 kg

Whole Fresh fruit: 10 kg

Non-food waste: 5 kg

The students eat lunch in school about 180 times in a year. Predict the amount of waste for each item in a year.

Step #1

Lunch room collection	Tally	Frequency	Fraction	Percent
Fruit scraps		20	$\frac{20}{50}$	40%
Food scraps				
Fresh fruit				
Non-food waste				

Step #2

Lunch room collection	Percent	Amount of Waste
Fruit scraps	40%	40% of 180 = $.40 \times 180 = 72$ kg
Food scraps		
Fresh fruit		
Non-food waste		



Name: _____ Date: _____

Practice: Probability Unit

Example 3:

There are 30 000 households in Picton. Two hundred households were surveyed to determine people's favourite shopping days. The table gives the results.

Favourite Shopping Days		
Day	Frequency	Percent
Monday	8	
Tuesday	10	
Wednesday	24	
Thursday	26	
Friday	34	
Saturday	58	
Sunday	14	
No preference	26	

- A) Complete the chart.
 B) Use the percents to predict the number of the 30 000 households in which each day is preferred.

Day	Percent	Prediction
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		
No preference		

- C) In how many households is there no preference?

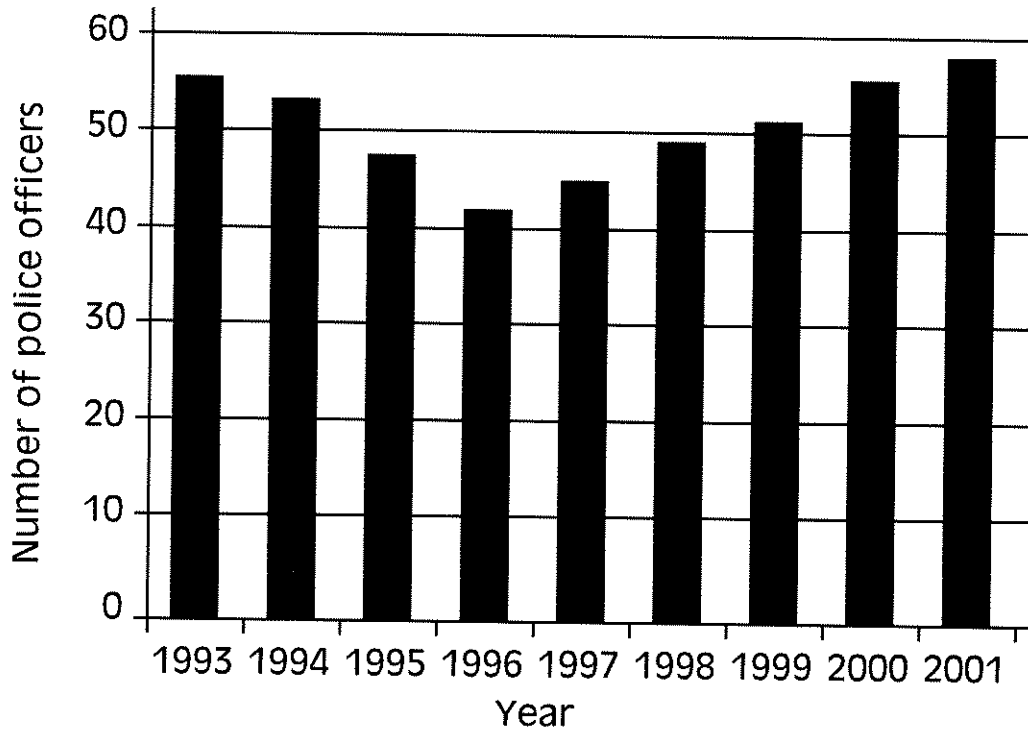
Mathpower 8 Textbook
Homework: Page 315 (3–4)



Practice: Probability Unit

Bar graphs are used to compare similar things.

Number of police officers in Crimeville, 1993 to 2001



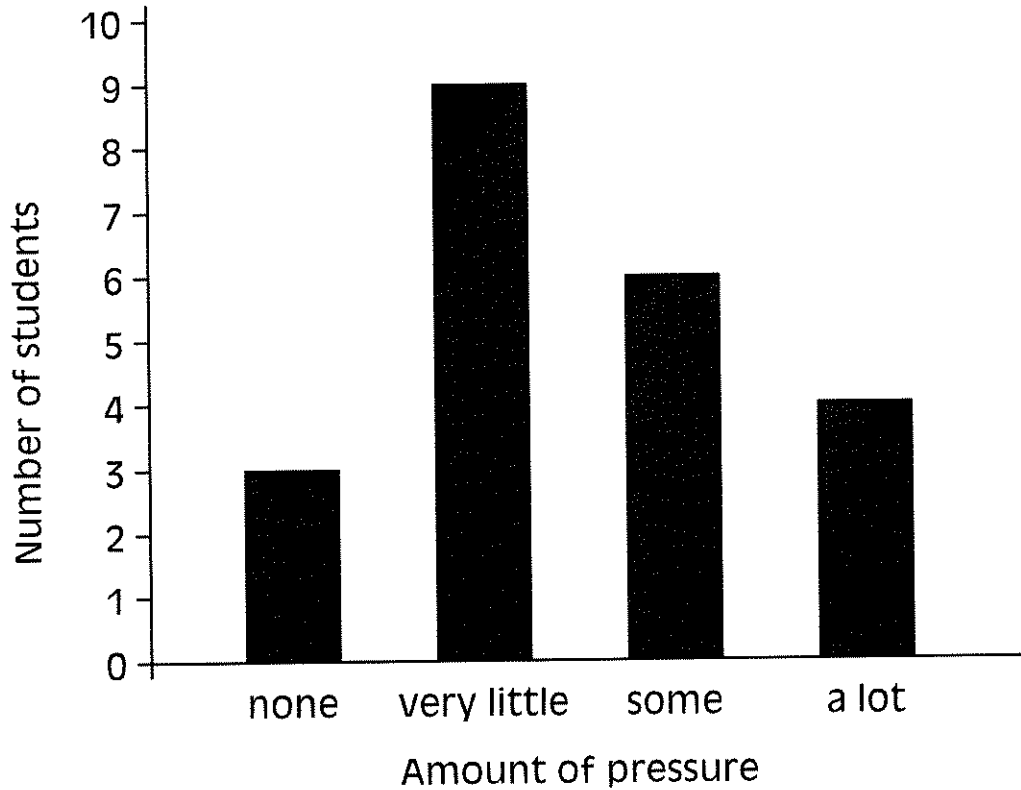
Questions:

1. In what year did Crimeville have the **most** police officers?
2. What was the **difference** in police officers between 1996 and 1993?
3. In which **two years** were there the **closest number** of officers in Crimeville?



Practice: Probability Unit

Pressure from School Work



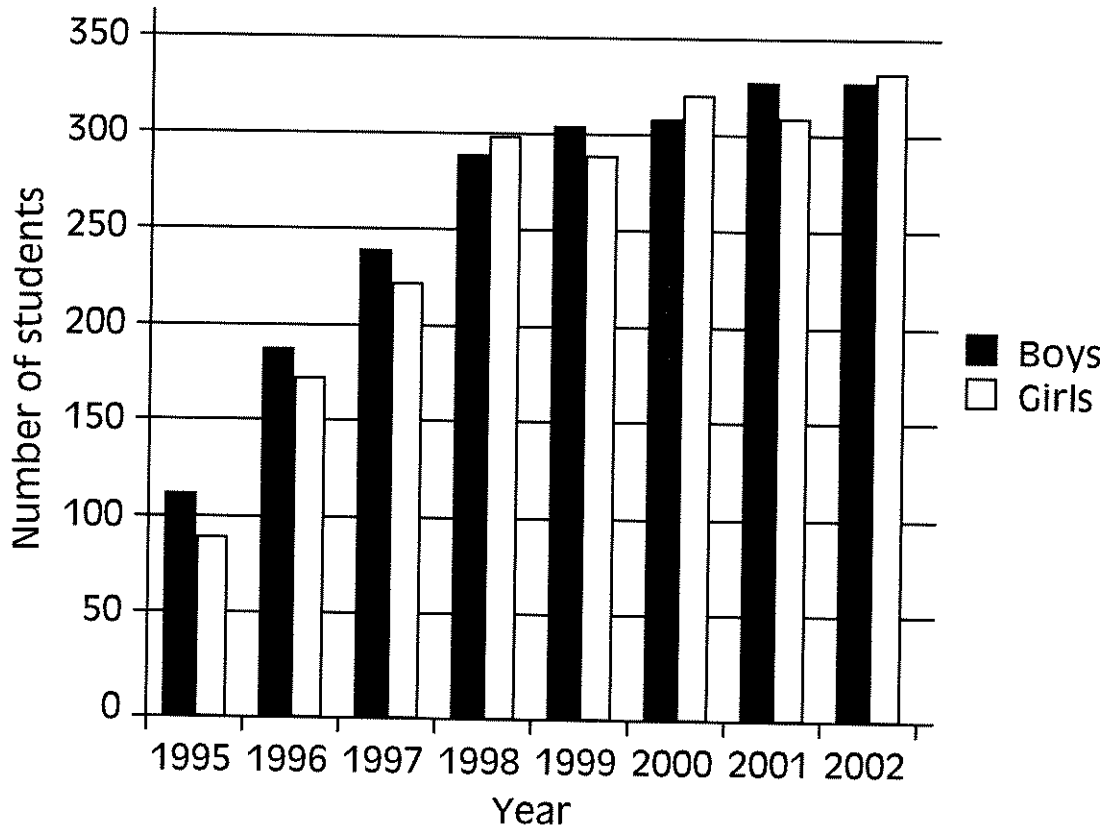
Questions:

1. How many students were surveyed?
2. What was the **difference** in the amount of pressure between those students who said "none" to those who said "very little"?



Practice: Probability Unit

**Internet use at Redwood Secondary School,
by gender, 1995 to 2002**



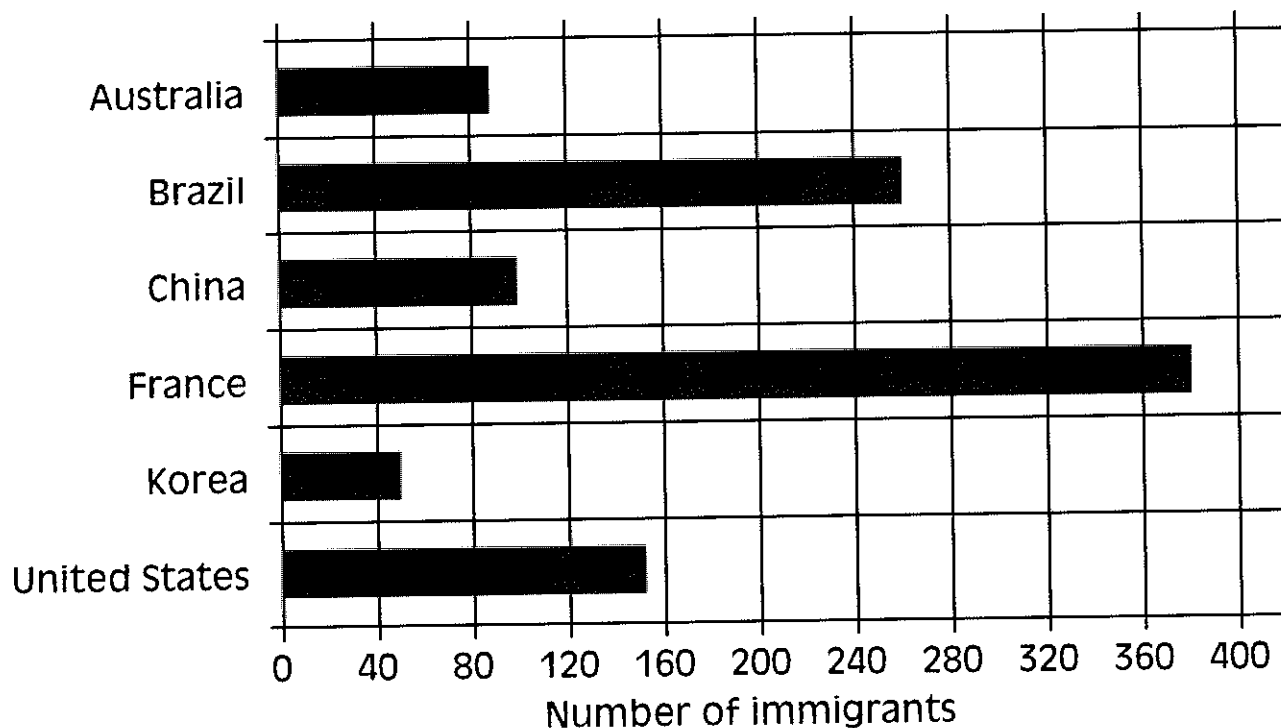
Questions:

1. Approximately how many **total students** used the internet in 1998?
2. How many **more** girls than boys used the internet in 2002?
3. In which year did was there the **biggest difference**?



Practice: Probability Unit

Number of students at Diversity College who are immigrants, by last country of permanent residence

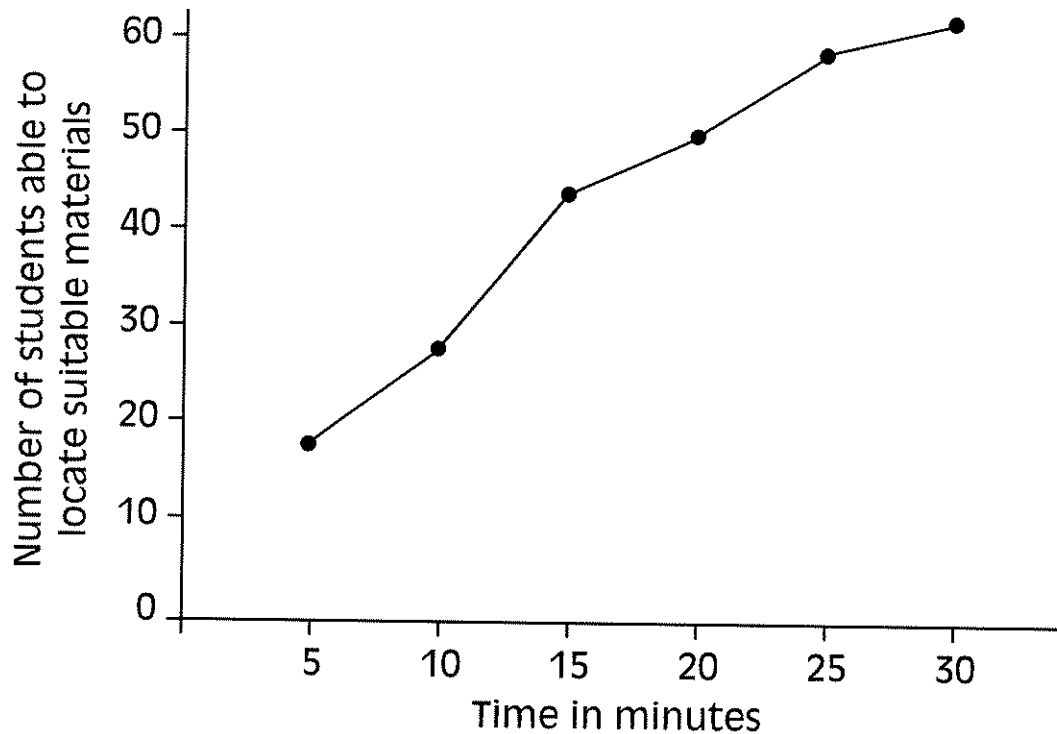


Question:

1. How many immigrants were surveyed?

**Practice:** Probability Unit

Let's try some broken line graphs.

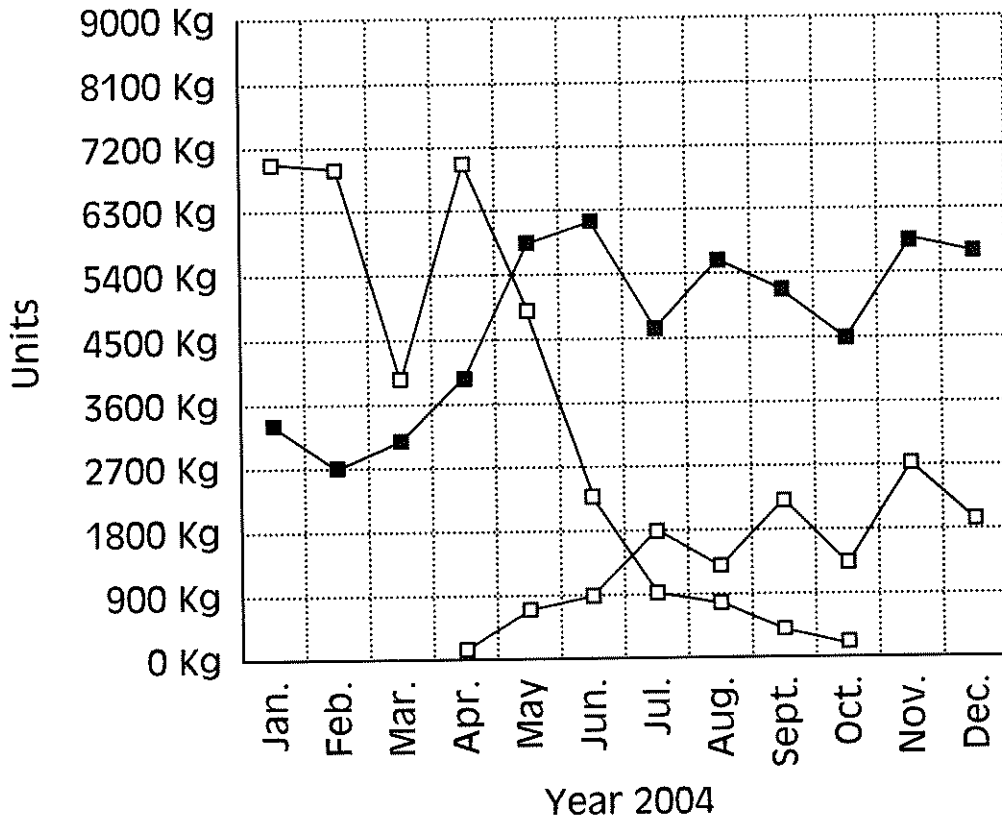
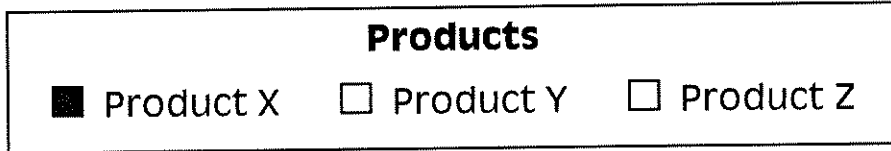
Time Needed to Locate Suitable Library Materials**Questions:**

1. Approximately how many **minutes** would it have taken for 35 students to locate suitable materials?
2. What was the **difference** in the number of students from 10 minutes compared to 15 minutes?
3. How many students were surveyed?



Practice: Probability Unit

Unit Production



Questions:

- Which product had the greatest change from the month of March to the month of April?
- How much was that change? (in units)
- What are the readings (approximately) for all three products in the month of July?

X =
Y =
Z =

**Practice:** Probability Unit 1 of 2

On every bar graph, we need to do the following:

- Decide on the **width** of each bar.
- **Label** the horizontal axis (x-axis) – use descriptive words from the chart.
- **Label** the vertical (y-axis) – use descriptive words from the chart.
- Choose a **scale** for the y-axis that allows all of the numbers to be shown (you may need to skip some numbers at the beginning using a break mark).
- **Plot** the data (numbers) using bars.
- Give the graph a **title**.

Let's try one!

The following table gives the average number of hours students spend in class each year in several countries.

Country	Hours
Canada	975
Denmark	1040
Germany	760
New Zealand	1000
China	858
France	972
Japan	933
United Kingdom	950

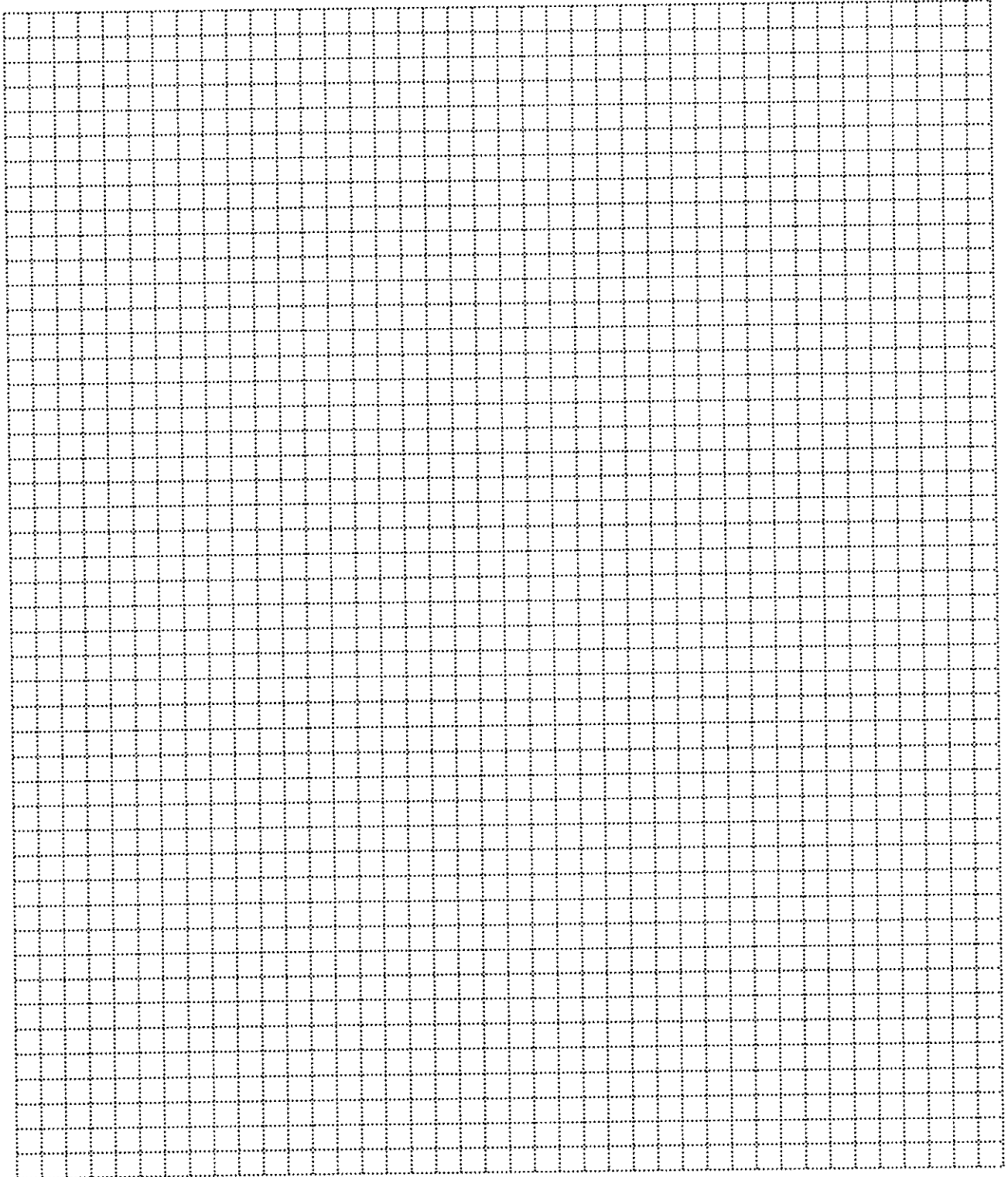


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Practice: Probability Unit

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Display the data using a bar graph.



**Practice:** Probability Unit 1 of 2

On every broken-line graph, we need to do the following:

- **Label** the horizontal axis (x-axis) – use descriptive words from the chart.
- **Label** the vertical (y-axis) – use descriptive words from the chart.
- Choose a **scale** for the y-axis that allows all of the numbers to be shown.
- Choose a **scale** for the x-axis (if needed).
- **Plot** the data using dots.
- **Connect** the dots.
- Give the graph a **title**.

Let's try one!

The following table gives the areas burned by forest fires in Canada in 7 time periods.

Time period	1920's	1930's	1940's	1950's	1960's	1970's	1980's
Area (millions of hectares)	13	14	11	9	10	13	24

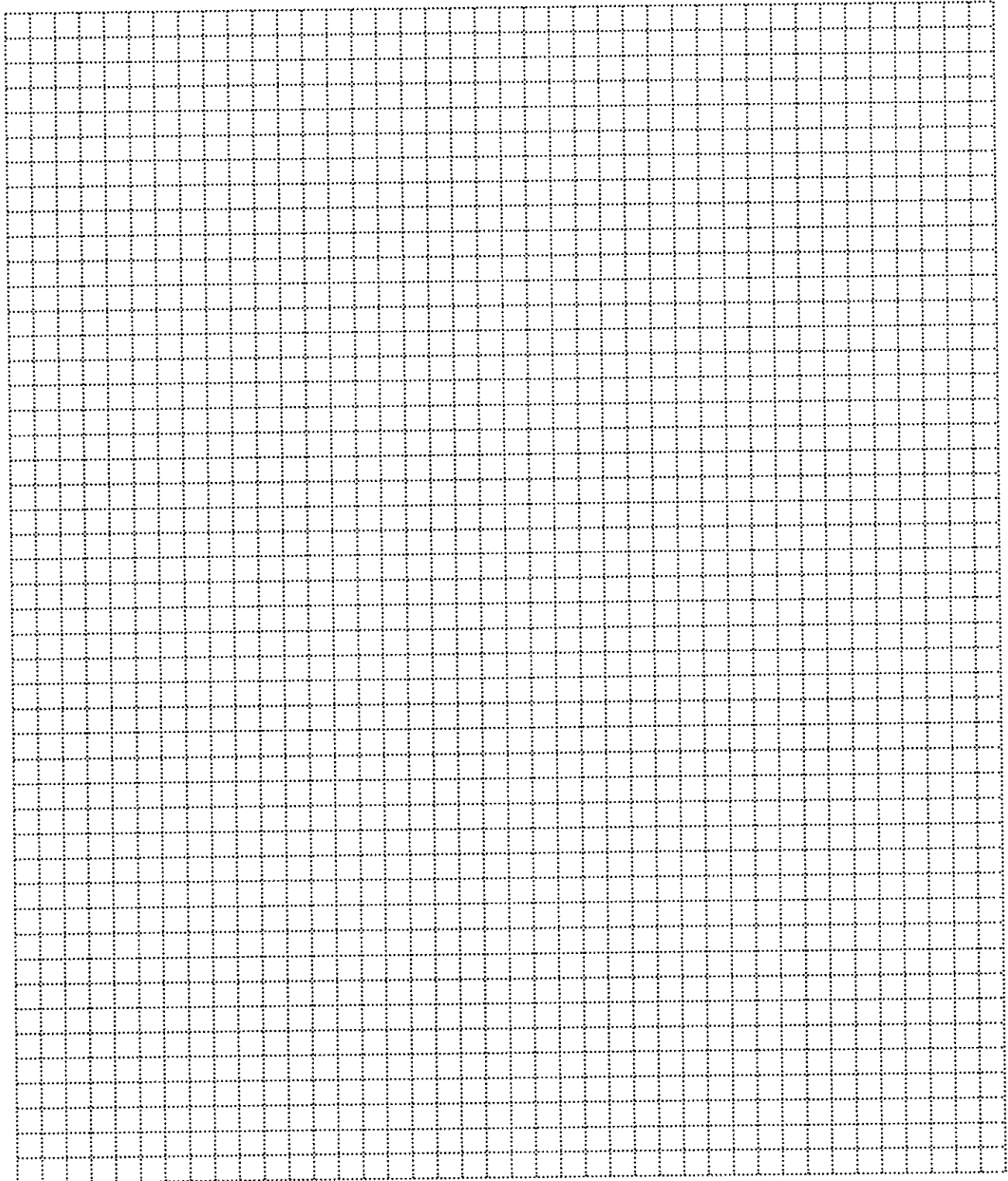


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Practice: Probability Unit

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Draw a broken line graph that represents the **areas burned by forest fires** during different time periods.



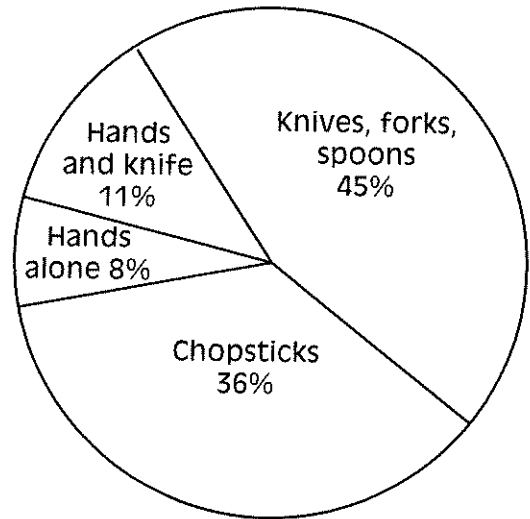


Practice: Probability Unit

A circle graph shows us how something is divided into parts.

What do people around the world use for eating?

The world's current population rounded to the nearest billion is...7 000 000 000.



What should all of the percentages add up to in a circle graph?

Use the circle graph to answer the following questions.

Questions:

1. Approximately how many people in the world use knives, forks, and spoons for eating?

% of _____ (let's take off some zeros and add them to our answer at the end)

_____ × _____

= _____

2. Approximately how many people in the world use chopsticks for eating?

% of _____ (let's take off some zeros and add them to our answer at the end)

_____ × _____

= _____

3. Would you say most of the people in the world use a knife?



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Practice: Probability Unit

1 of 2

What should all angles in a circle graph add up to? _____

What should all percents in a circle graph add up to? _____

Steps for making a circle graph:

- Complete the chart.
 - Percentages
 - Degrees
- Find the centre of the circle (label it with a small dot).
- Draw a radius line from that centre.
- Draw in all the angles using a protractor (get numbers from your chart).
- Label each sector with a name and a percent (from chart).
- Give the graph a title.

Let's try one!

Display the following data using a circle graph.

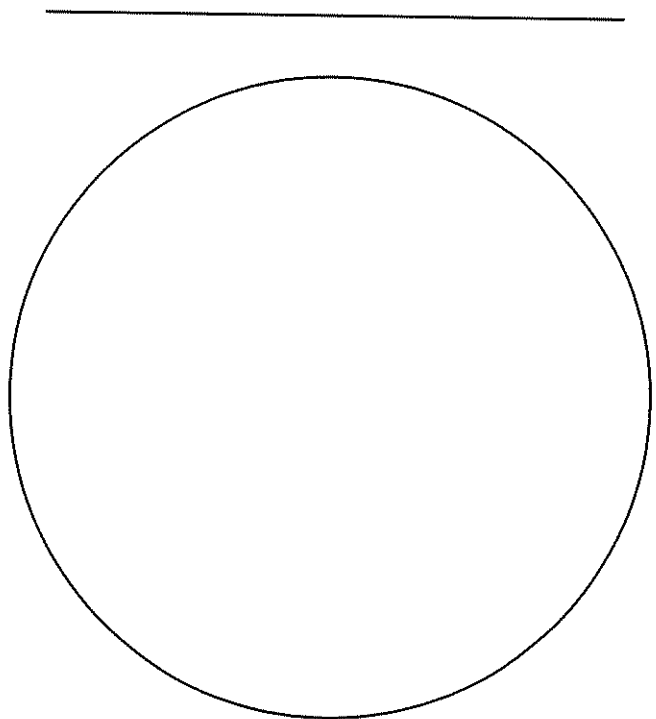


Practice: Probability Unit

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A survey asked 500 people at what time they usually get out of bed. The results are shown in the table.

Time	Number	Percent	Angle Size
05:00 – 06:00	125		% of 360°
06:00 – 07:00	160		% of 360°
07:00 – 08:00	75		% of 360°
08:00 – 09:00	75		% of 360°
Other	50		% of 360°
Totals:			

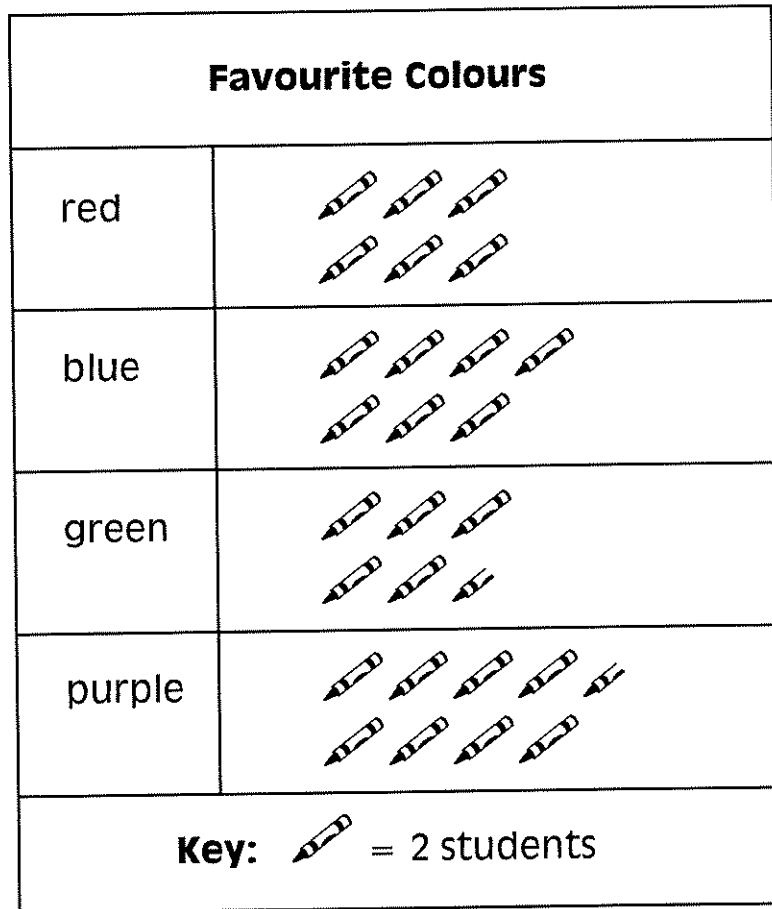




Practice: Probability Unit

A pictograph uses picture symbols to convey the meaning of statistical information. Pictographs should be used carefully because the graphs may, either accidentally or deliberately, misrepresent the data. This is why a graph should be visually accurate.

Figure 1. The favourite colours of 2 different classrooms in your school.



Questions:

1. Which was the colour picked most frequently?
2. How many students like the colour green?
3. How many students were surveyed?
4. How many more students liked purple compared to blue?

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Practice: Probability Unit

A few species of plants and animals have survived from prehistoric times. The table lists some of them and the number of years they have been on Earth.

Draw a pictograph based on the following table:

Species	Millions of Years
Giant Redwood	110
Peripatus (worm)	520
Australian lungfish	230
Duck-billed platypus	160
Lingula (sea animal)	570
Tuatara (reptile)	190

Do not forget to choose a symbol and show what each symbol represents. Do not forget the title for your graph.

↳ NOTES:

Probability Unit

Mean:

When given a set of numbers it is the average. (You add them all up and divide by how many numbers there are.)

Example: 1, 2, 2, 6, 6, 6, Mean =

Mode:

It is the number that occurs most often.

Example: 1, 2, 2, 6, 6, 6, Mode =

Median:

- It is the middle number.
- You have to order your set of numbers in numerical order first.
- If there are two middle numbers, you must find their average to calculate the median.

Example: 6, 8, 2, 5, 2 Median =

Example: 1, 2, 2, 6, 6, 6, Median =

Range:

The difference between the highest and lowest numbers in a set.

Example: 1, 2, 2, 6, 6, 6 Range =

Name: _____ Date: _____



Practice: Probability Unit

1. Calculate the mean, mode, median and range of the following set of data.

23 , 26 , 25 , 33 , 24 , 27 , 24

Mean =

Mode =

Median =

Range =

2. John had a mean of 75 on 5 of his tests. His first four marks were 80, 85, 60 and 64. What did he get on his fifth test?

3. Calculate the mean, mode, median and range of the following set of data.

14, 21, 22, 30, 25, 26, 28, 20, 30, 15, 19, 23, 24, 29, 31

Mean =

Mode =

Median =

Range =



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Practice: Probability Unit

Outcome: _____

Example: _____

Equally Likely: _____

Example: List all the possible outcomes when rolling a die and tossing a coin.

Probability: _____

Probability Formula: $P =$

Example 1: Find the probability of the following following when rolling a die.

$P(6) =$

$P(\text{even}) =$

$P(\text{not } 3) =$

$P(7) =$

$P(1-6) =$

$P(3 \text{ or } 4) =$

The range of probability :

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Practice: Probability Unit

1 of 2

Events are _____ if each outcome has no effect on the other.

For example, the outcome of the toss of a coin does not affect the outcome of the roll of a die. Thus, these outcomes are independent events.

Experimental Probability –

Theoretical Probability –

Example 1: A red die and a blue die are rolled at the same time, and the sum is found. Calculate each probability.

- a) sum of 7
- b) an even sum
- c) sum less than 6

	Outcome on Red Die						
	+	1	2	3	4	5	6
Outcome on Blue Die	1						
	2						
	3						
	4						
	5						
	6						



Practice: Probability Unit

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Example 2: A set of 5 cards has a different vowel written on each card. A card is chosen from a deck of 52 playing cards, and a vowel is chosen from the vowel cards. What is each probability?

- a) a black and an A, **P (B, A)**
- b) a red and a vowel, **P (R, V)**
- c) a red card and an O or U, **P (R, O, or U)**

Example 3: Without looking Josh took one card from each of 3 decks. What is the probability that the 3 cards he took are the jack of clubs, the ace of spades, and the 7 of diamonds?

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Practice: Probability Unit

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$$\text{Probability} = \frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}$$

Example 1: Use the spinner to answer the following questions. Express each answer as a fraction, decimal and percent.

- a. P (3)
- b. P (5 or 6)
- c. P (even number)
- d. P (a number greater than 7)
- e. P (a number from 1 to 8)
- f. P (the number 11)

You can see from the above example that an IMPOSSIBLE outcome has a probability of _____, and a CERTAIN outcome has a probability of _____. Therefore we say that probability has a range between _____ and _____.



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Practice: Probability Unit

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Example 2: You have a bag of marbles containing 5 blue, 2 red and 3 green marbles. Find the following:

$$P(\text{red}) =$$

$$P(\text{not green}) =$$

$$P(\text{blue}) =$$

Example 3: You roll a die.

$$P(1) =$$

$$P(2 \text{ or } 3) =$$

$$P(\text{even number}) =$$

$$P(\text{less than } 4) =$$

$$P(7) =$$

$$P(\text{not } 4 \text{ or } 6) =$$