

Summer Packet

2019-2020

Name: _____

Grade: 8

Algebra



**FOUNDATIONAL SKILLS
PART 8: PROBLEM SOLVING**

Solve. Clearly document your work.

- 1) If the sides of a rectangular garden are whole numbers and the area of the garden is 48 square feet, how many combinations of side lengths are possible? List all combinations.

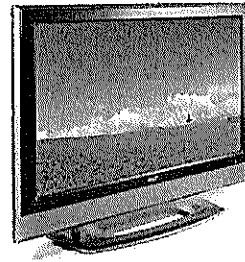


- 2) Marlee bought a large bag of Jolly Ranchers. She gave 17 pieces to her cousin and then gave 10% of what was left to her neighbor. She then ate 3 pieces and divided the rest equally among her three brothers, each of whom got 38 pieces. How many pieces did Marlee originally have? (Hint: Work Backwards)

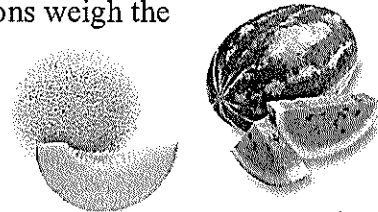


- 3) For a school project, Tim recorded how much TV he watched in one weekend and what kinds of programs he watched. The following are the times he watched TV:
SATURDAY: 9:30-10:30 a.m.; 1:00-3:30 p.m.; 8:00-10:00 p.m.
SUNDAY: 1:00-2:30 p.m.; 8:00-10:00 p.m.

Tim watched sports programs for $\frac{1}{2}$ of the time.
He watched movies for $\frac{1}{3}$ of the time. He watched cartoons with his sister Audrey the rest of the time.
How many minutes did Tim watch cartoons?



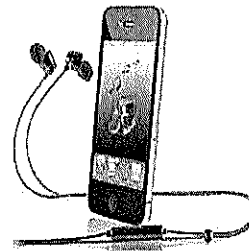
- 4) Three watermelons and two cantaloupes weigh 32 pounds. Four watermelons and three cantaloupes weigh 44 pounds. All watermelons weigh the same and all cantaloupes weigh the same. What is the weight of two watermelons and one cantaloupe?



5. At an electronics store, earphones cost \$20, video games cost \$50, An MP3 player costs \$220. You have three coupons to apply to the purchase of these items:

- 15% off any one item
- \$10 off any one item
- Any one item is half-price

You can use only one coupon per item. Which coupon should apply to which item so that you minimize the final price? Excluding tax, what is the final price?



More problem solving opportunities at <http://www.gamequarium.com/problemsolving.html>.

Baseball Players

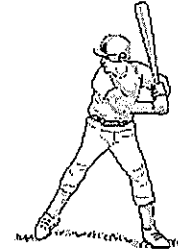
This problem gives you the chance to:

- work with averages
-

1. The mean weight of nine players on a baseball team is 177 pounds.

Find the **total weight** of the nine players. _____

Show your work.



2. The mean weight of the nine players and three reserve players is 188 pounds.

Find the **mean weight** of the three reserve players. _____

Show how you figured it out.

3. The opposing baseball team has nine players whose weights, in pounds, are 174, 177, 194, 162, 196, 169, 187, 192, 178.

Find the median and the range of these weights.

median _____

range _____



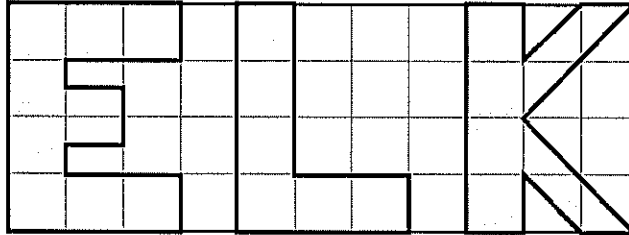
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Baseball Players Test 6: Form A

Square Elk

This problem gives you the chance to:

- find areas and perimeters of shapes on a square grid



1. The word ELK is drawn on 1-centimeter squares.
Find the area of each of the letters.



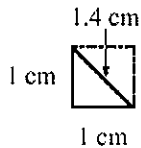
(The center square of the letter E is a 1-centimeter square.)

Area of E = _____ cm²

Area of L = _____ cm²

Area of K = _____ cm²

- 2.



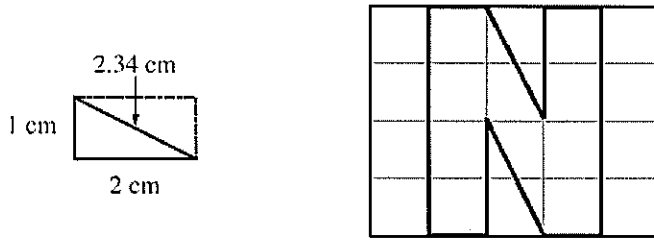
The length of the diagonal of a 1-centimeter square is approximately 1.4 centimeters. Use this measurement to help you calculate the perimeter of each letter.

Perimeter of E = _____ cm

Perimeter of L = _____ cm

Perimeter of K = _____ cm

3. The letter N is drawn on 1-centimeter squares. The length of the diagonal of a rectangle measuring 1 centimeter by 2 centimeters is approximately 2.34 centimeters.



Find the area and perimeter of the letter N.
Show your calculations.

Area of N = _____ cm²

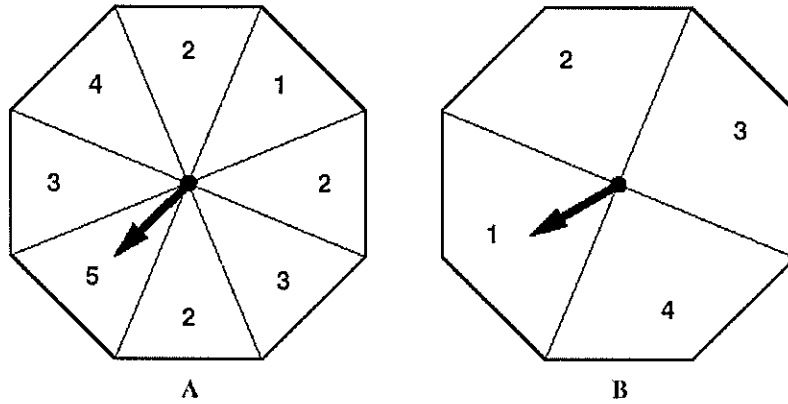
Perimeter of N = _____ cm

Spinners

This problem gives you the chance to:

- decide the probability of events, using two spinners
-

Tasha has two spinners, A and B. Each spinner is a regular octagon.



score = the number the spinner lands on

1. For each of the following statements, put a check mark (✓) if it is true.

Put an X if the statement is not true.

A score of 1 is more likely on spinner A than on spinner B. _____

A score of 2 is more likely on spinner A than on spinner B. _____

A score of 3 is equally likely on spinner A and on spinner B. _____

2. Tasha says, "A score on spinner A plus a score on spinner B is **certain** to be less than 10."

Is she correct? _____

Explain how you know.

3. Tasha decides to multiply the score she gets on spinner A by the score she gets on spinner B.

What is the highest score she can get? _____

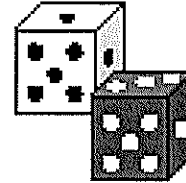
What is the lowest score she can get? _____

Write down all the different scores Tasha can get.

School Days

- This problem gives you the chance to:
- + interpret scores given in a table
 - + work out probabilities from a table of possible scores

Ahmed, Brenda, Chad and Diane are playing a board game called 'School Days'.



For this game they have 2 special dice, a black one and a white one.

The faces of both dice are numbered 1, 1, 3, 5, 6 and 7.

To play the game, they throw the two dice and add the scores together. Below is a table showing the possible total scores for this game. The numbers in bold show the possible total scores.

The total score gives the number of places they move on the board.

Some of the squares on the board have prizes or penalties.

1. Ahmed wants to move 6 places to reach the 'have a day off' square.

In how many different ways can he get a total score of 6 with the two dice?

What is the probability that he will get a total score of 6 with the two dice?

Score on black die

	1	1	3	5	6	7
1	2	2	4	6	7	8
1	2	2	4	6	7	8
3	4	4	6	8	9	10
5	6	6	8	10	11	12
6	7	7	9	11	12	13
7	8	8	10	12	13	14

Score on white die

Explain how you figured it out.

2. Brenda does not want to move to the next square because it is a 'get sent to the principal' square.

What is the probability of her getting a total of 1 when she throws the two dice? _____

3. Chad is on a 'fast' square. He wants to throw an even number so that he gets a 'good grade' and can have an extra turn.

What is the probability that Chad will get an even number? _____

Explain how you figured it out.

4. Diane is on the 'homework' square. She can only move by throwing a double (the same number on both dice).

What is the probability that she will be able to move off the 'homework' square on the next move? _____

Explain how you figured it out.

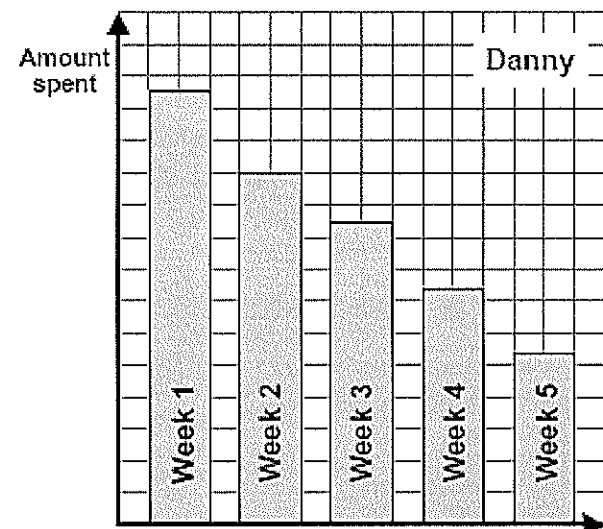
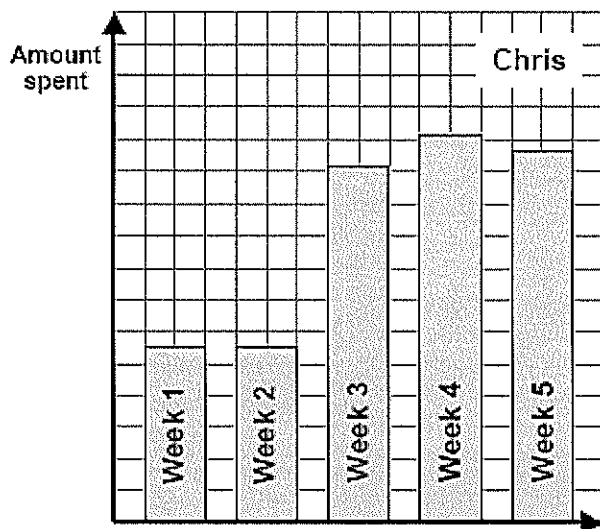
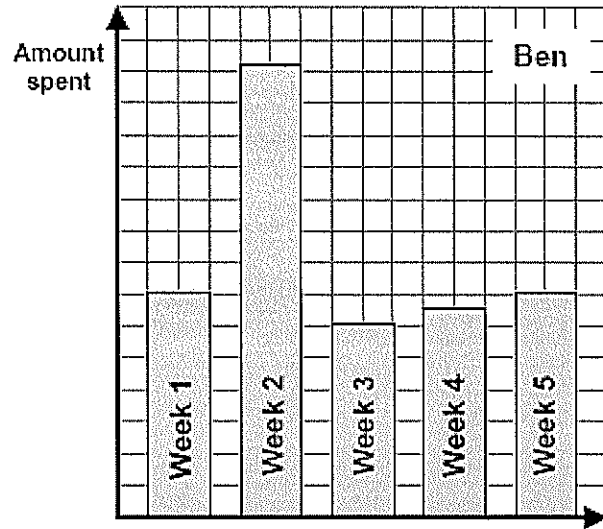
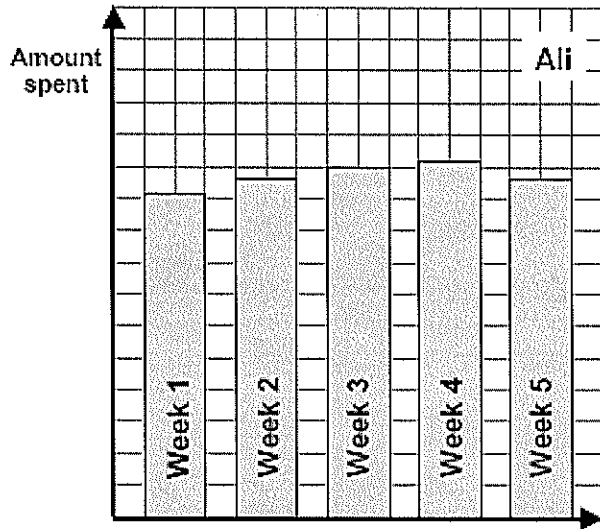


Money

This problem gives you the chance to:

- interpret bar charts
-

These bar charts show how much money four children, Ali, Ben, Chris and Danny, spent each week for five weeks.



1. This is what the four children said about what they had spent.
Write the correct name next to each statement.

"I spent less and less money each week."

Name: _____

"I spent more in the last three weeks than in the first two."

Name: _____

"I spent about the same amount each week except one week when I bought an expensive present for my sister."

Name: _____

"I spent about the same amount each week."

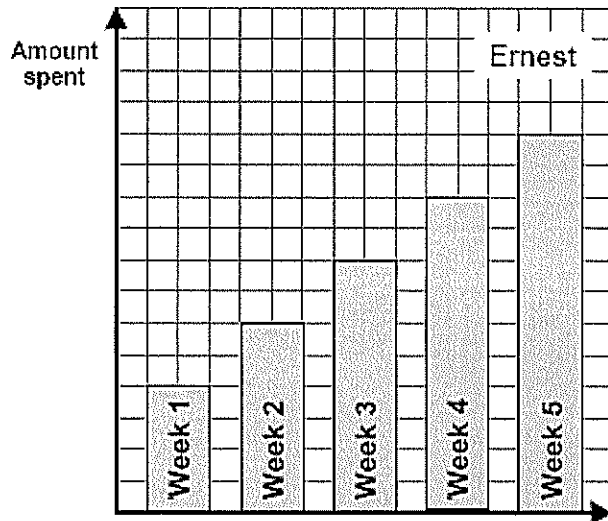
Name: _____

2. a. Which child spent the most money in the first week? Name: _____

- b. Which child spent the most money altogether? Name: _____

Show how you know.

3. This bar chart shows how much Ernest spent during the five weeks.
Write a description to fit Ernest's bar chart.



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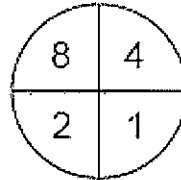
Winning Spinners

This problem gives you the chance to:

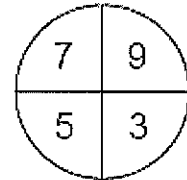
- work with probability

Bill is playing a game of chance at the School Fair.

He must spin each of these two spinners.
If the sum of the numbers is an even number,
he wins a prize.



Spinner A



Spinner B

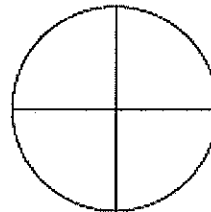
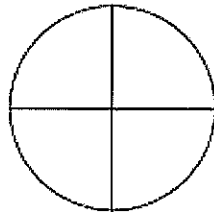
- Fill in the empty boxes in the addition chart below to show the possible totals.

Spinner A

	+	8	4	2	1
7	15	11	9	8	
9		13			
5	13			6	
3			5		

Spinner B

- What is the probability of Bill winning a prize? _____
- Using two new spinners, rearrange the same eight numbers to increase Bill's chances of winning.



What is the probability of Bill winning using his new spinners? _____

Show how you figured it out.

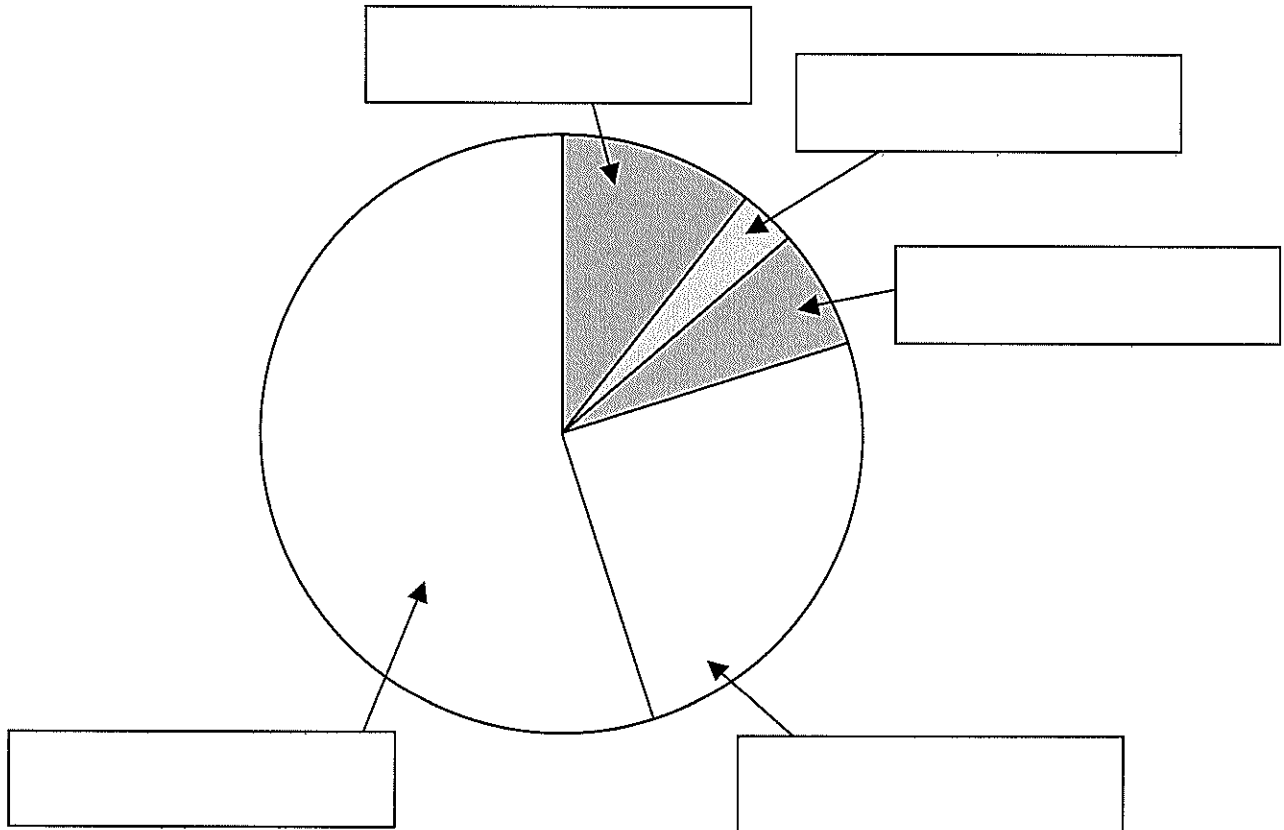
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Nuts

This problem gives you the chance to:

- work with interpretations of a circle graph
-

This circle graph shows the amounts of five different kinds of nuts grown in the U.S each year.



Here are some facts about the nuts grown.

- Most of the nuts are Almonds
- A quarter of the nuts are Walnuts
- The least grown nuts are Macadamias
- There are about twice as many Pistachios as Macadamias grown
- ∞ The fifth type of nuts is Hazelnuts

1. Write the correct kind of nut on each label.
2. The total amount of all nuts grown is 956 thousand tons.

What amount of walnuts is grown? _____ thousand tons

Show your calculations.

3. Iris says that 80% of all the nuts grown in the U.S. are almonds.

Explain why Iris is wrong.

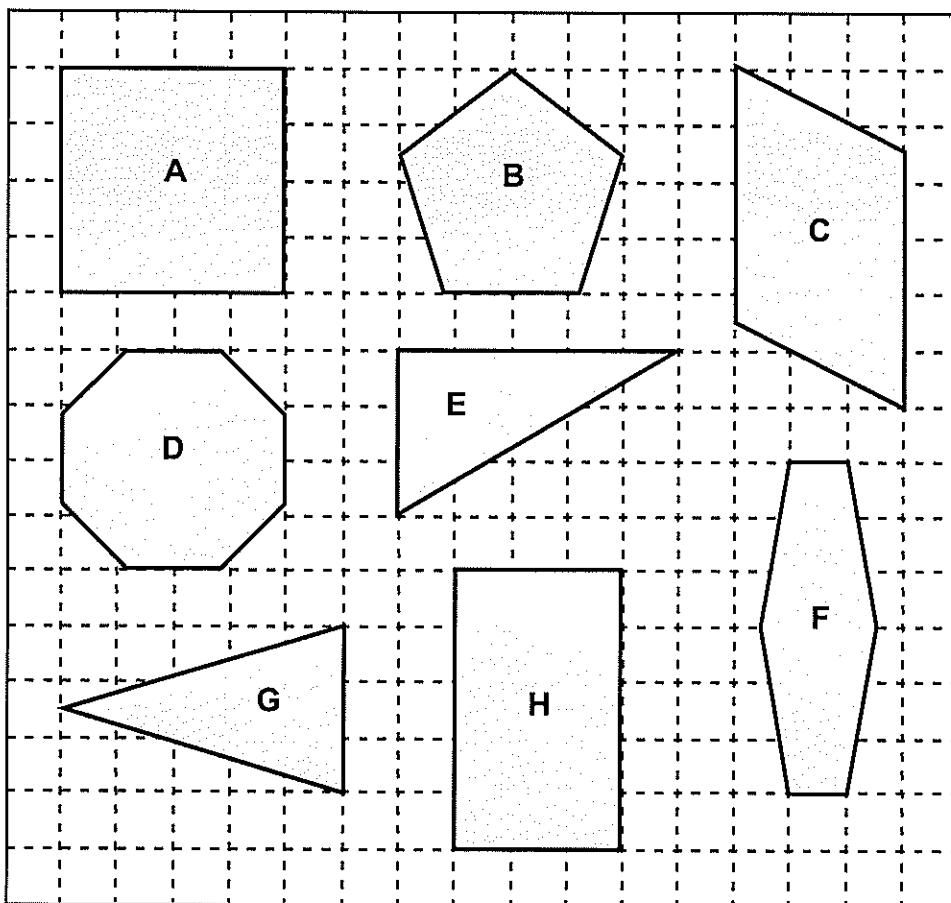
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Sorting Shapes

This problem gives you the chance to:

- recognize and name shapes and their properties
 - draw a shape to meet given conditions
-

Here are some two dimensional shapes drawn on square grid paper.

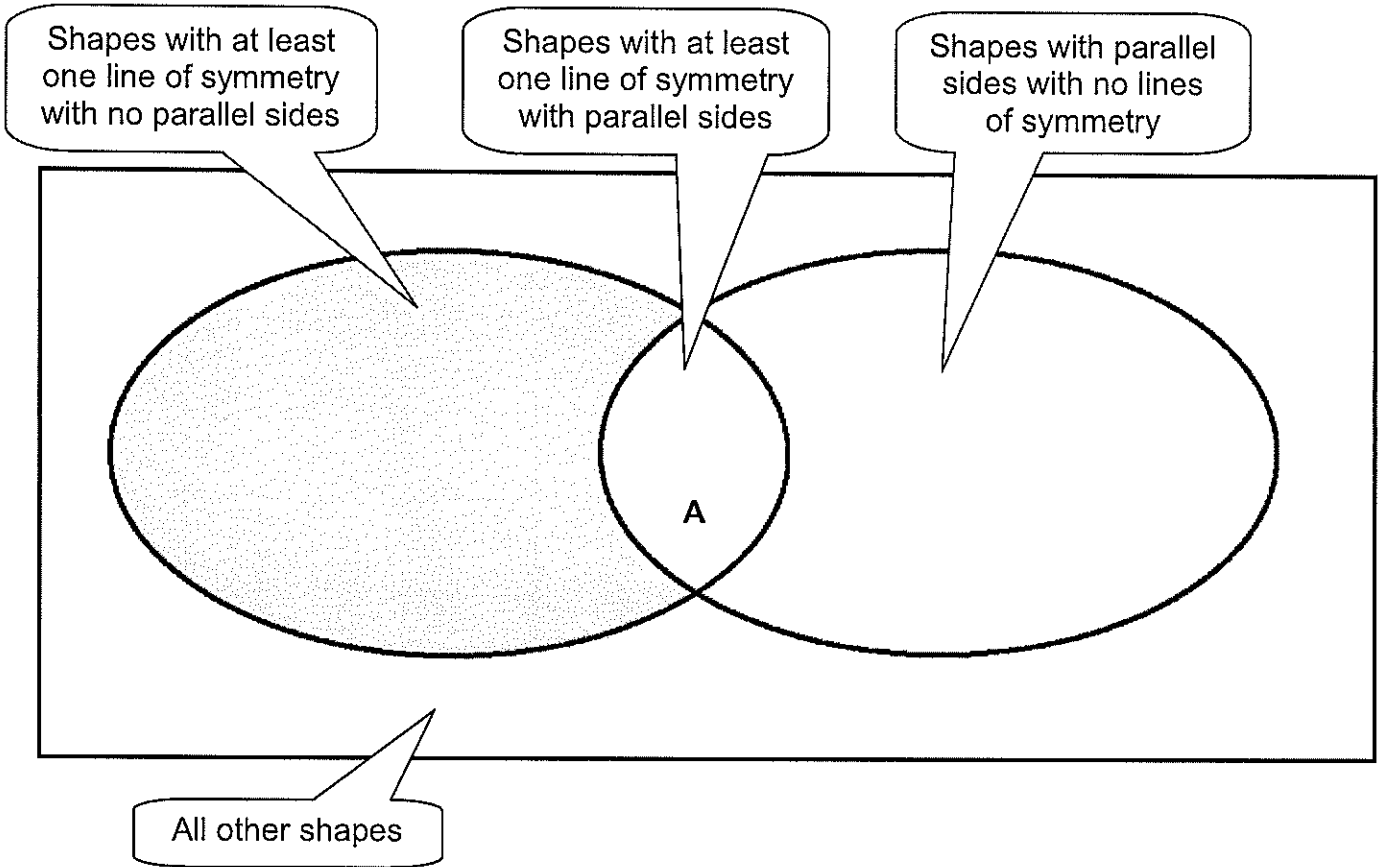


1. What is the mathematical name of shape F? _____
2. How many lines of symmetry does shape D have? _____
3. Write the letter of each shape in the correct region of the diagram on the next page.

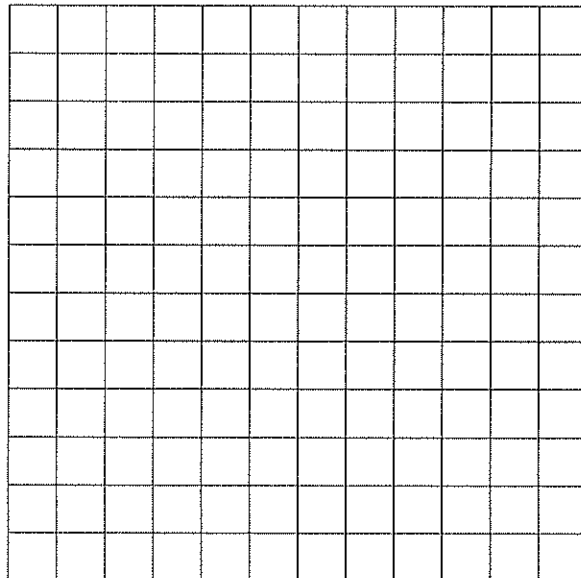
The first one has been done for you.

Sixth Grade – 2006

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4. Draw another shape that could go into the shaded region.



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Sorting Shapes Test 6

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Tetra

This problem gives you the chance to:

- complete scores in a table of results
- work out probabilities from a table of possible scores

Anna and Bill play the game Tetra.

In this game two four-sided dice numbered 1 to 4 are tossed.

The numbers on the base of each dice are then multiplied together to get a score.

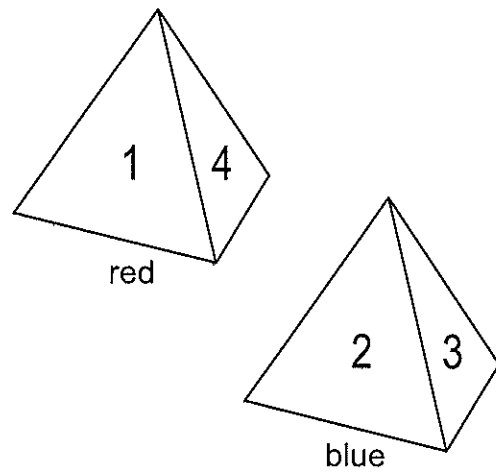
When the score is even Anna gets a point.

When the score is odd Bill gets a point.

1. Complete this table of score results.

Number on base of red dice	4	4	8		16
	3	3	6		
	2	2		6	
	1	1		3	4
X		1	2	3	4

Number on base of blue dice



2. Explain why the probability of getting a score of 4 is $\frac{3}{16}$.

3. Find the probability that Anna gets a point.

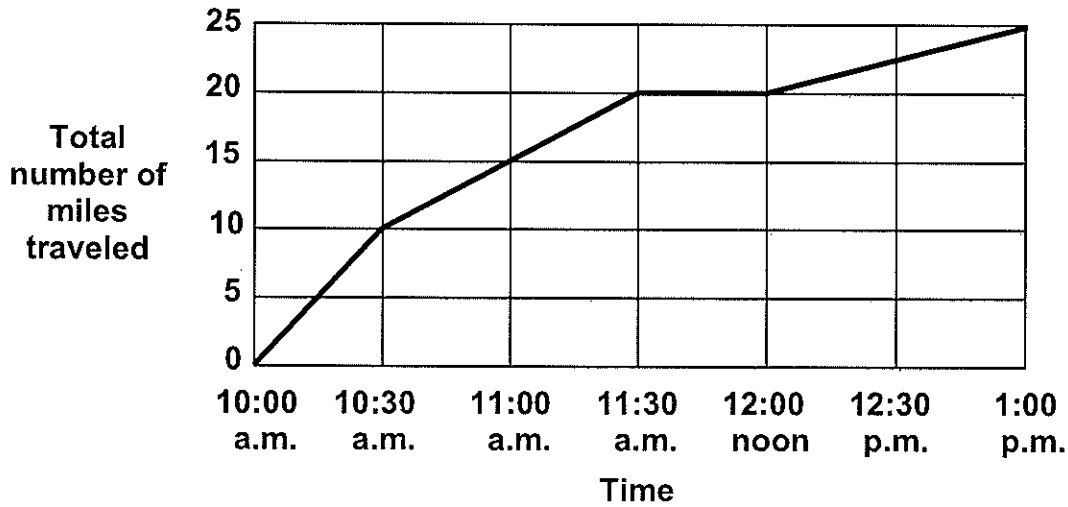
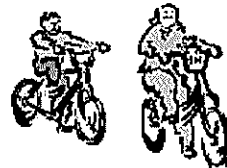
Explain your work.

Bike Ride

This problem gives you the chance to:

- interpret a distance/time graph

Selina and Jack went for a bike ride today.
They made this graph of their bike ride.



1. How many miles did they travel in all? _____ miles
2. How long did their bike ride take? _____ hours
3. When were they cycling the fastest? _____

Explain your answer.

4. What does the graph show that they did between 11:30 a.m. and 12 noon?

Explain your answer.

5. What was their speed between 12 noon and 1 p.m.?

_____ miles an hour

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Card Game

This problem gives you the chance to:

- figure out and explain probabilities
-

Mrs Jakeman is teaching her class about probability.

She has ten cards, numbered 1 to 10.

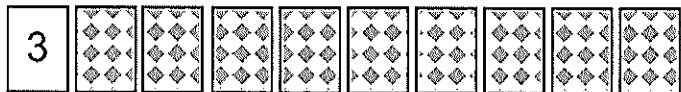
She mixes them up and stands them on a shelf so that the numbers do not show.



Mrs. Jakeman turns the cards around one at a time.

Students have to guess whether the next card will have a higher or a lower number than the one just turned.

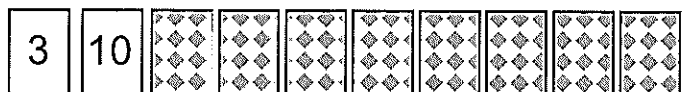
The first card turned is the number 3.



1. Would you expect the next number to be higher than 3 or lower? _____

Explain why you made this decision.

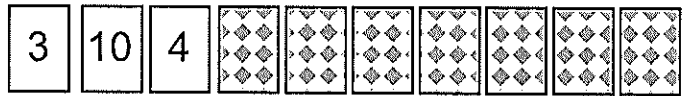
The second card is number 10.



2. What is the probability that the next card will be a higher number than 10? _____

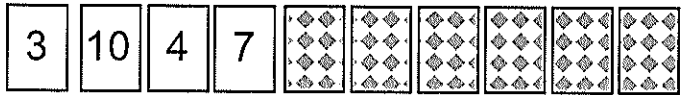
Explain how you know.

The third card is number 4.



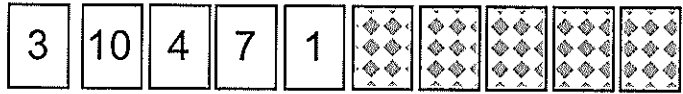
3. What is the probability that the next number is higher than 4?
Show your work.

The fourth card is number 7.



4. What is the probability that the next number is lower than 7?
Show your work.

The fifth card is the number 1.



When the sixth card is turned the probability that the next card is higher is the same as the probability that it is lower.

5. What must the sixth card be?

Explain how you figured it out.
