Sample Assessment Questions

Mathematics

GRADE 3

Alberta Government

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Sample Assessment Questions

Grade 3 Mathematics

Overview

Purpose

This document is designed to support classroom assessment practices. The questions offer insights regarding some of the knowledge and understanding as well as some of the skills and processes students are expected to demonstrate in mathematics by the end of Grade 3.

This resource is just one of many that teachers may use at their discretion in their classrooms to assess students, and is not intended to act as a formal assessment tool on its own.

Contents

There are 40 multiple-choice questions in this document. They are based on outcomes from the four strands (Number, Patterns and Relations, Shape and Space, Statistics and Probability) from the Grade 3 Mathematics Program of Study. Information about the outcomes, the level of complexity, and the key is also provided.

Sample Assessment Questions
Grade 3 Mathematics
Key and Outcome Information

The table below provides information about each question: the keyed response, the level of complexity (Low, Moderate, or High), the mathematical strand and primary outcome on which the question is based, and the item description with the supporting outcome(s) (when applicable).

Question	Key	Level of Complexity*	Mathematical Strand and Primary Outcome	Item Description with Supporting Outcome(s) (when applicable)
1	D	L	SS.7	Analyze and sort groups of 2-D shapes.
2	C	L	SS.5	Calculate the perimeter of a given shape. (Also N.1)
3	B	L	N.2	Identify the greatest number that is represented by base-ten blocks. (Also N.5)
4	A	L	SS.6	Classify 3-D objects by identifying the number of edges and the shapes of faces.
5	A	L	N.9	Calculate the difference between a one-digit number and a two-digit number.
6	B	M	SS.5	Measure and compare the perimeters of shapes illustrated on geoboards.
7	C	L	SP.1	Identify the line plot graph that represents data from a tally mark chart.
8	B	L	PR.4	Solve an equation that contains a symbol representing an unknown number.
9	A	H	N.2	Identify the number expression that represents a three-digit number. (Also N.9)
10	C	L	N.1	Count forward by 4, starting from a three-digit number. (Also PR.1)
11	D	L	N.13	Recognize fifths as part of a whole.
12	C	L	SS.1	Relate the passage of time (days) to a common activity, using a calendar.
13	D	L	N.1	Count forward by 100 from a random starting point. (Also PR.1)
14	B	L	PR.1	Use a chart, which displays an increasing (by 3) number pattern, to solve a problem. (Also N.1)
15	B	M	PR.1	Compare two patterns in order to identify a pattern rule (increase by 5). (Also N.1)
16	A	M	N.8	Select a number expression that represents one way to make an accurate estimate.
17	A	M	N.11	Demonstrate an understanding of multiplication facts to 16 and use addition to solve a problem. (Also N.3 and N.9)
18	C	M	N.9	Find the difference between two three-digit numbers, using symbols and/or pictures.
19	C	M	N.4	Estimate a quantity of less than 1000.
20	D	M	PR.1	Extend an increasing pattern and predict the number of items in the next shape. (Also N.1)
21	D	M	SP.1	Interpret data from a pie chart and select a graph that accurately represents the same information.
22	D	M	SP.1	Analyze data from a list and identify the corresponding bar graph. (Also SP.2)

Question	Key	Level of Complexity*	Mathematical Strand and Primary Outcome	Item Description with Supporting Outcome(s) (when applicable)
23	A	L	PR.2	Identify the next set of shapes in a decreasing pattern.
24	A	L	PR.1	Identify a pattern rule and identify the next three items in that pattern.
25	B	M	N.3	Identify a number by understanding the term *greatest* and applying knowledge of place value.
26	D	M	N.2	Understand the terms *odd*, *greater than*, and *sum* to determine a number. (Also N.3 and PR.3)
27	D	M	PR.1	Interpret data from a table to determine a pattern and make a prediction based on that pattern. (Also N.9)
28	D	L	SS.6	Identify and name the 2-D faces of an everyday 3-D object.
29	B	M	N.4	Estimate an amount under 100 using a referent.
30	A	L	SP.2	Use information from a tally chart to accurately label a bar graph. (Also SP.1)
31	D	L	N.2	Identify a three-digit number that is represented by an expression.
32	C	L	PR.1	Extend a pattern that is increasing. (Also N. 9 and N. 10)
33	D	M	SS.4	Estimate the mass of three objects using a referent. (Also PR. 4)
34	A	L	N.9	Find the difference between two 3-digit numbers.
35	B	M	N. 9	Add three-digit numbers that are represented pictorially with base-ten blocks. (Also N.5)
36	B	L	SS.7	Identify, sort, and count sets of shapes (triangles, quadrilaterals, hexagons).
37	A	M	SS.1	Using a calendar, determine the passage of time in weeks and days.
38	D	M	N.9	Solve a problem by subtracting and/or adding two-digit and one-digit numbers. (Also N.10)
39	A	L	N.11	Demonstrate an understanding of repeated addition. (Also N.9)
40	C	H	N.1	Count forward by 3s to 60 to solve a problem. (Also PR.1 and SS.2)

N – Number
PR – Patterns and Relations
SS – Space and Shape
SP – Statistics and Probability

***Levels of Complexity**

Low-complexity Questions (L)

Low-complexity questions typically require students to recall and/or recognize basic mathematical concepts and procedures. Students are not expected to come up with original methods for finding a particular solution.

A low-complexity mathematics question may require a student to
- recall or recognize a fact, term, or definition
- identify an example of a concept
- perform a specified procedure (e.g., adding or subtracting)
- determine an unknown number in an equation or number expression
- solve a one-step or simple two-step word problem
- draw or measure a simple 2-D shape or 3-D object
- retrieve information from a graph, table, or figure

Moderate-complexity Questions (M)

Moderate-complexity questions typically involve more flexibility of thinking than those in the low-complexity category. They require a response that goes beyond the habitual and may involve more than a single step. Students are expected to decide what to do, to use reasoning and problem-solving strategies, and to bring together their skills and knowledge to find a solution.

A moderate-complexity mathematics question may require a student to
- solve a word problem requiring multiple steps
- compare patterns, data, or equations
- provide justification for a solution process
- interpret a concrete, pictorial, or symbolic representation
- retrieve information from a graph and use it when solving a multi-step problem
- formulate a generalization about one or more objects or patterns

High-complexity Questions (H)

High-complexity questions typically require students to engage in more-abstract reasoning, planning, analysis, judgment, and creative thought.

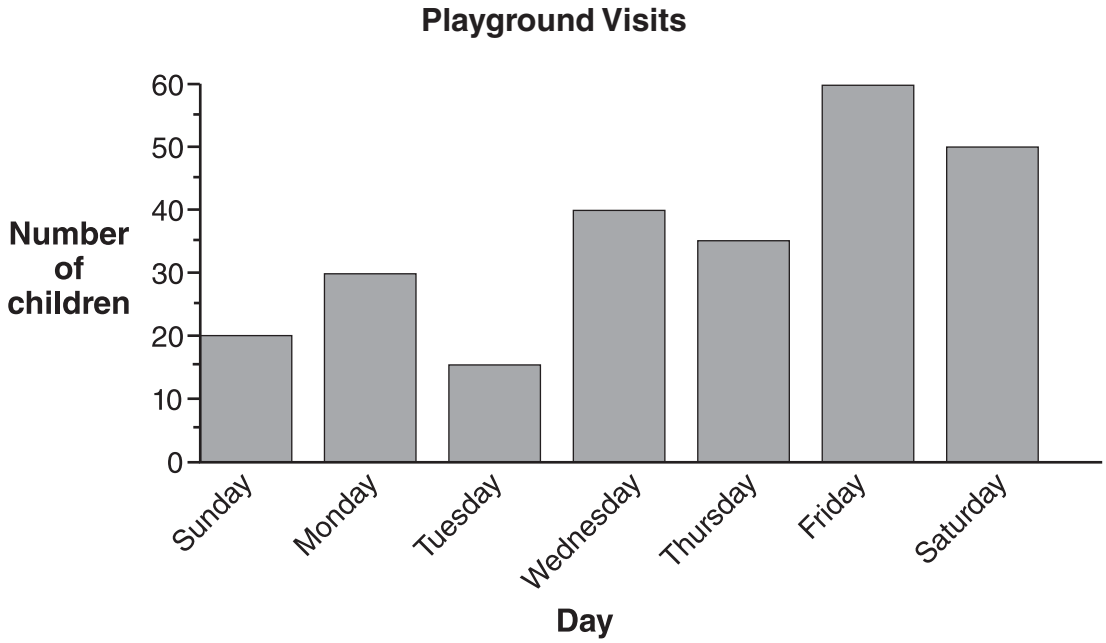
A high-complexity mathematics question may require a student to
- perform a procedure that has multiple steps and multiple decision points
- analyze similarities and differences between procedures and concepts
- formulate an original problem
- solve a problem in more than one way
- explain and justify a solution to a problem
- describe, compare, and contrast solution processes
- provide a numerical justification

Adapted from Norman L. Webb, Wisconsin Center for Educational Research, ***Depth-of-Knowledge Levels for Four Content Areas***, March 28, 2002.

Sample Assessment Questions
Grade 3 Mathematics
Example Questions

Example 1

This bar graph shows the number of children who visited a playground during the past week.



The total number of children who visited the playground on Sunday is

- ○ 25 children
- ● 20 children
- ○ 15 children
- ○ 10 children

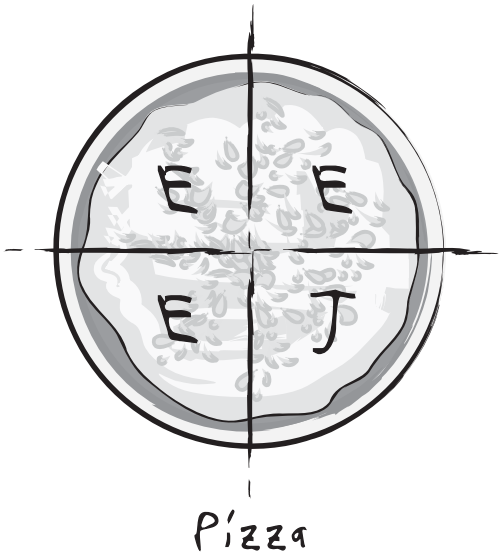
The correct answer in this example is **20 children**.

The circle beside the correct answer has been filled in.

Example 2

The picture shown below represents the amount of pizza that James and Eva eat.

James eats $\frac{1}{4}$ of the pizza and Eva eats $\frac{3}{4}$ of the pizza.



How many pieces of pizza does Eva eat?

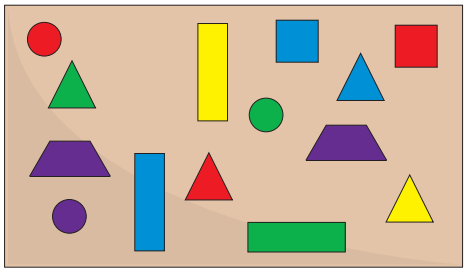
- ○ 1
- ○ 2
- ● 3
- ○ 4

The correct answer in this example is **3**.

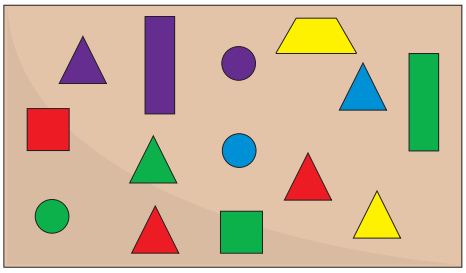
The circle beside the correct answer has been filled in.

Remember: Mark only **ONE** answer for each question.

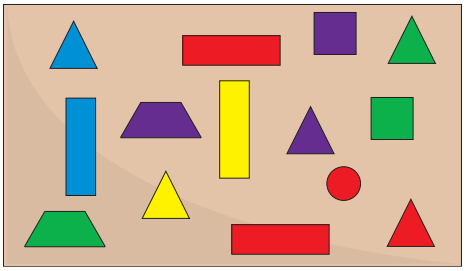
1. Nita looks at the shapes on the four mats shown below.



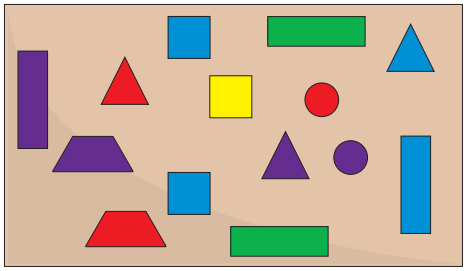
Mat 1



Mat 2



Mat 3

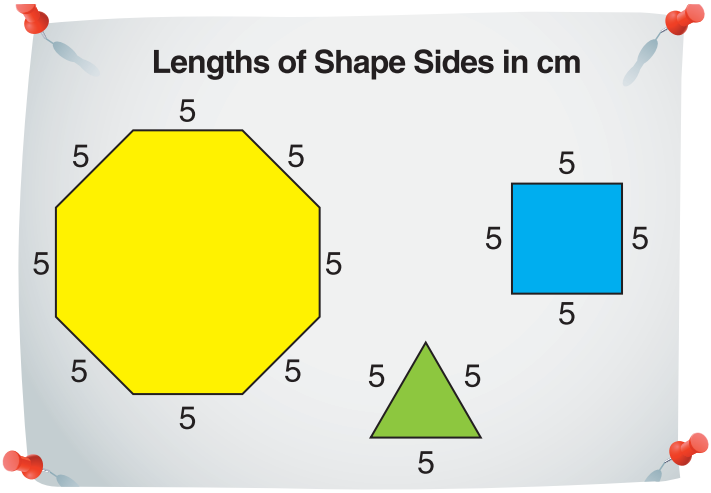


Mat 4

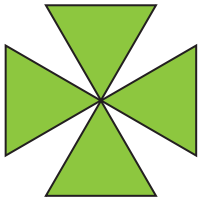
Which of the following two mats have the MOST square shapes altogether?

- ○ Mat 1 and Mat 2
- ○ Mat 1 and Mat 3
- ○ Mat 2 and Mat 3
- ○ Mat 3 and Mat 4

2. Students look at a chart that shows some shapes and the lengths of their sides.



Which of the following sets of shapes has a TOTAL perimeter of 50 cm?



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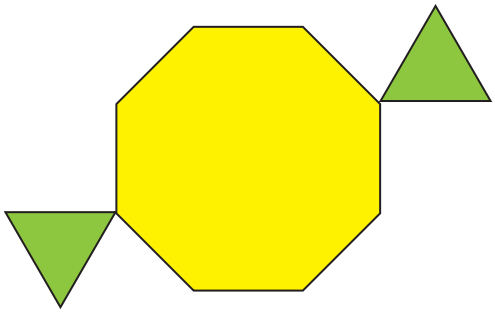

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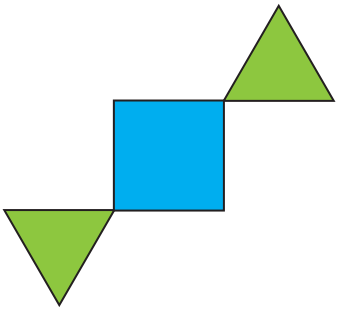

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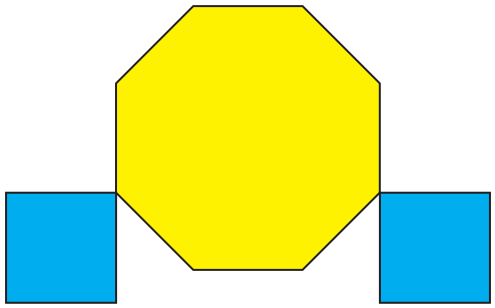

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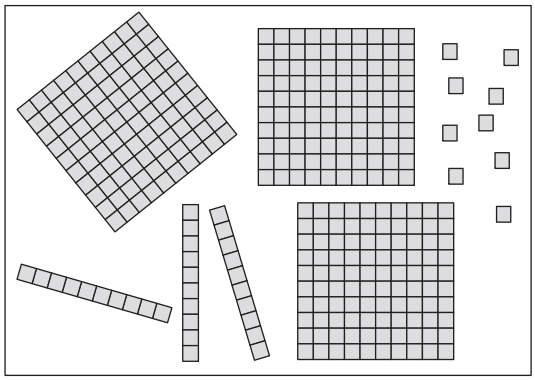
3. Students use base-ten blocks to represent numbers.

Which of the following sets of base-ten blocks shows the GREATEST number?



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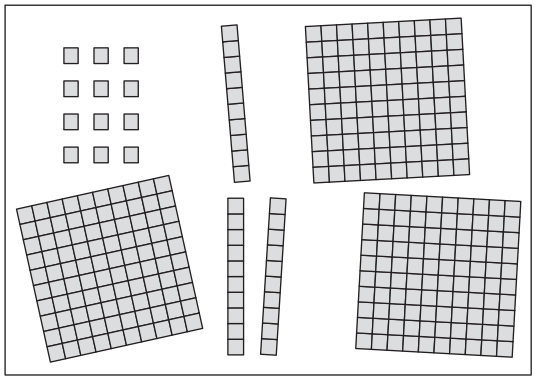

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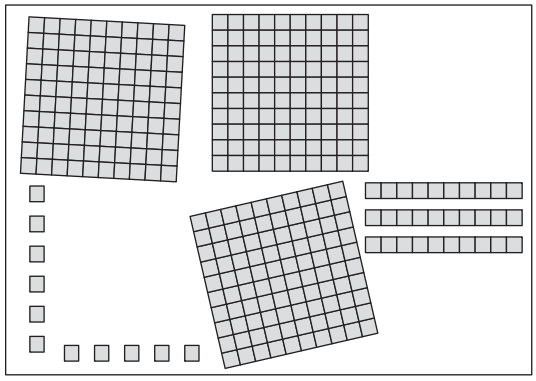

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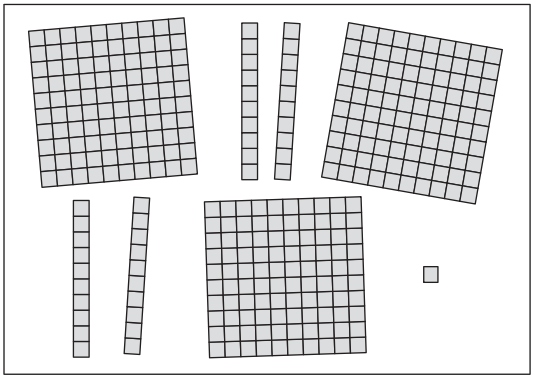

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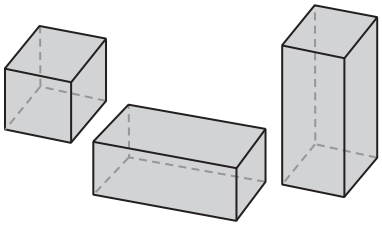
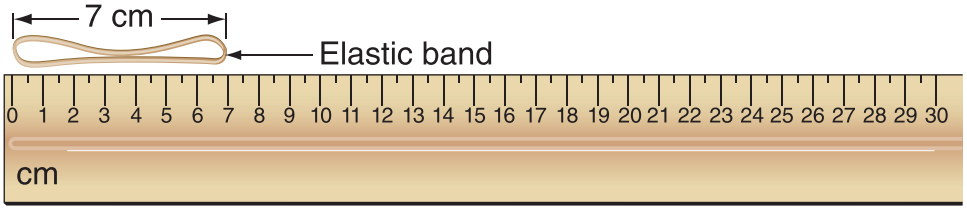
4. Max sorts three objects into the group shown below.



Which of the following rules does Max use?

- ○ Only square and rectangular faces
- ○ Only square and triangular faces
- ○ Exactly 10 edges
- ○ Exactly 8 edges

5. Erik has an elastic band that is 7 cm long, which he stretches until it is 26 cm long.

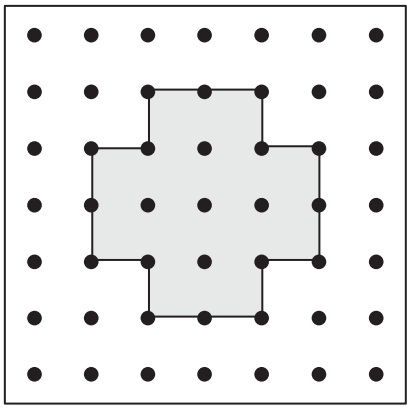


What is the difference between the length of the elastic band before Erik stretches it and the length after it is stretched?

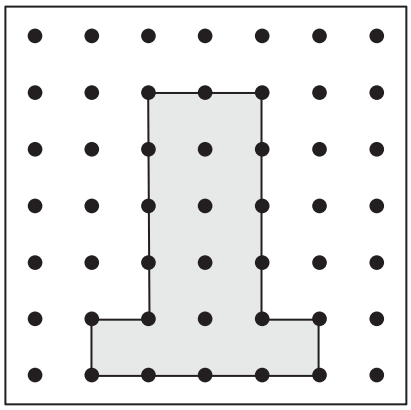
- ○ 19 cm
- ○ 21 cm
- ○ 23 cm
- ○ 33 cm

6. Nola uses some elastic bands to make different shapes on four geoboards.

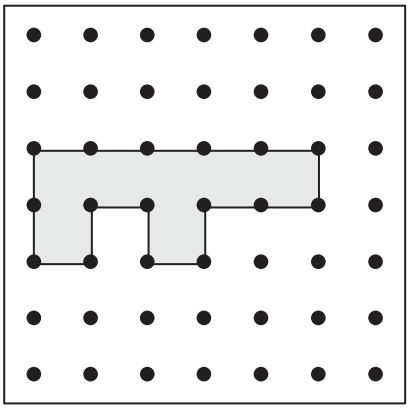
Geoboard A



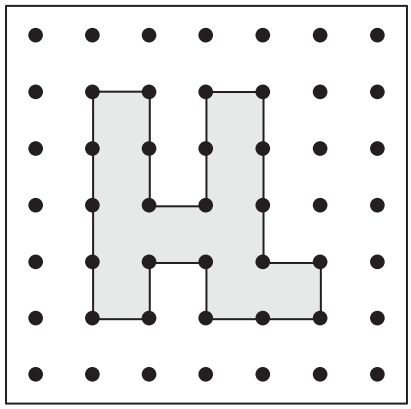
Geoboard B



Geoboard C



Geoboard D



The shapes that have the same perimeter are found on geoboards

- ○ A and B
- ○ A and C
- ○ B and D
- ○ C and D

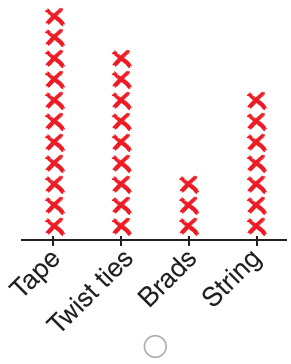
7. Students keep track of the number of fasteners that they use for their building projects.

Number of Fasteners

Tape	𝍸 𝍸 |
Twist ties	𝍸 |||
Brads	|||
String	𝍸 ||

The line plot that has the same information as the tally chart shown above is

Number of Fasteners Used



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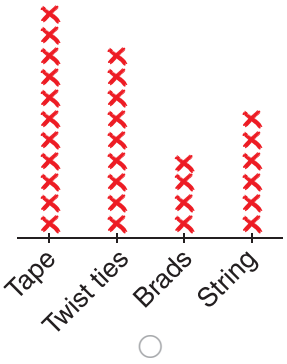
Number of Fasteners Used



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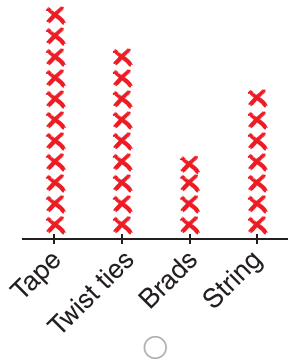
Number of Fasteners Used



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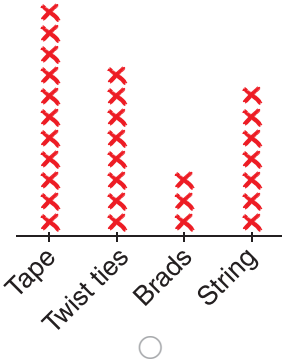
Number of Fasteners Used



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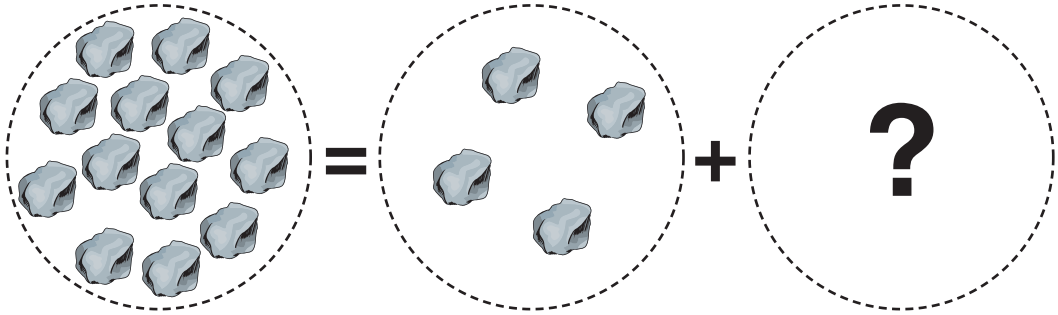
8. Justin groups some rocks to show the equation 13 = 4 + ?.



The number missing from Justin's equation is

- ○ 5
- ○ 9
- ○ 13
- ○ 17

9. Mandy uses 791 blocks to build a bridge.

The number 791 can be represented as

- ○ 829 – 38
- ○ 803 – 22
- ○ 779 + 32
- ○ 758 + 43

10. Some children measure the lengths of the bridges they have built. They record their measurements in the chart shown below.

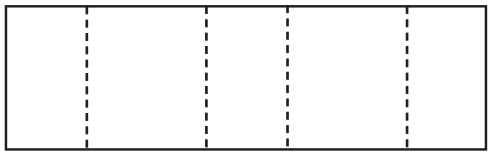
Lengths of Bridges

Bridge 1	Bridge 2	Bridge 3	Bridge 4	Bridge 5
228 cm	232 cm	236 cm	240 cm	**?**

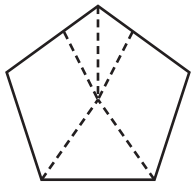
If the pattern in the chart continues, then how long is Bridge 5?

- ○ 248 cm
- ○ 246 cm
- ○ 244 cm
- ○ 242 cm

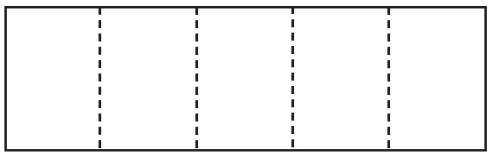
11. On her way to the park, Susan sees some children drawing shapes on the sidewalk.



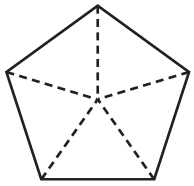
A



B



C



D

Which two shapes shown above are divided equally into fifths?

- ○ A and B
- ○ A and C
- ○ B and D
- ○ C and D

12. During the month of August, Jan walks her dog every Monday, Wednesday, and Saturday.

August						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

On how many days does Jan walk her dog in the month of August?

- ○ 4 days
- ○ 9 days
- ○ 13 days
- ○ 31 days

13. Jan skip-counts by 100. She begins her pattern at the number 375.

375			**?**	**?**

The last two numbers in Jan's counting pattern above are

- ○ 625 and 725
- ○ 625 and 775
- ○ 675 and 725
- ○ 675 and 775

14. Jan is saving money to buy a toy for her dog. Every week, Jan puts $3 into her money jar.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
$3	$6	$9					

How much money will Jan have in her money jar at the end of the 8^{th} week?

- ○ $21
- ○ $24
- ○ $26
- ○ $27

15. Erin compares the following two groups of numbers.

Group A	Group B
384, 389, 394, 399	687, 692, 697, 702

The number patterns in Group A and Group B both show skip counting by

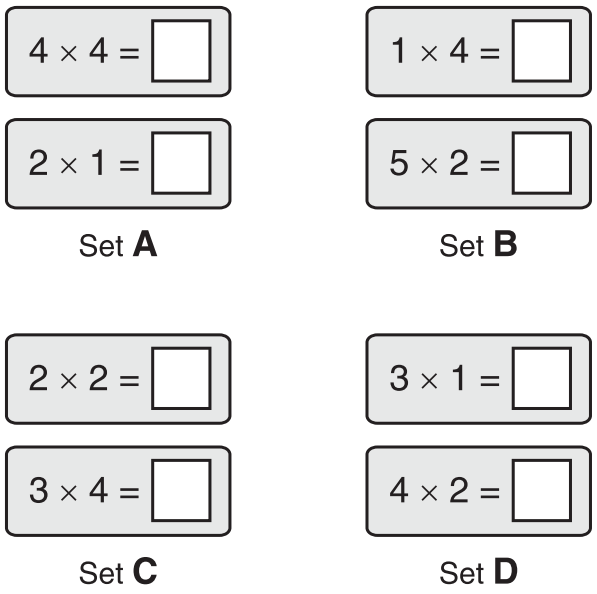
- ○ three
- ○ five
- ○ twenty-five
- ○ one hundred

16. Dan estimates that the sum of 43 + 56 is close to 100.

Which of the following ways shows how Dan could make this estimate?

- ○ 40 + 60
- ○ 56 – 43
- ○ 60 – 40
- ○ 100 + 60

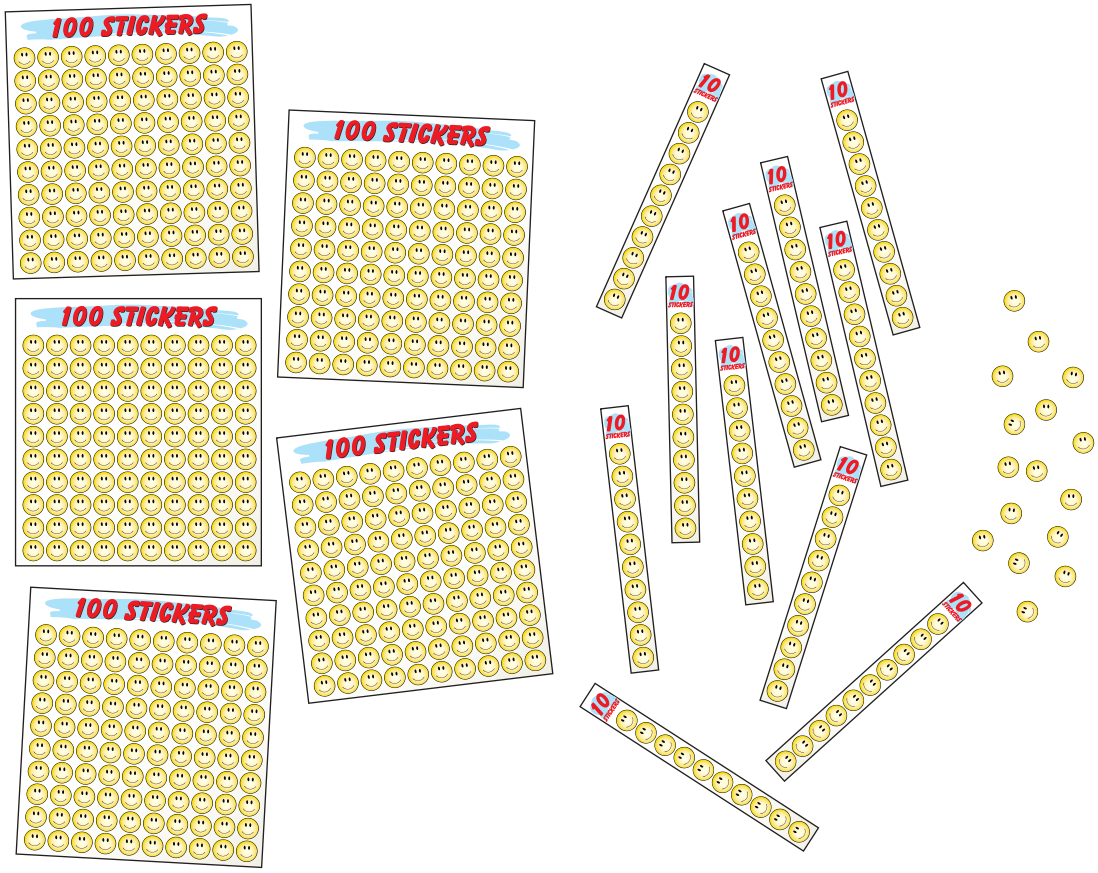
17. Scott has four sets of multiplication cards. He calculates the answer for each question. Then Scott calculates the sum of each set.



Which set of cards has a sum that is closest to 20?

- ○ Set A
- ○ Set B
- ○ Set C
- ○ Set D

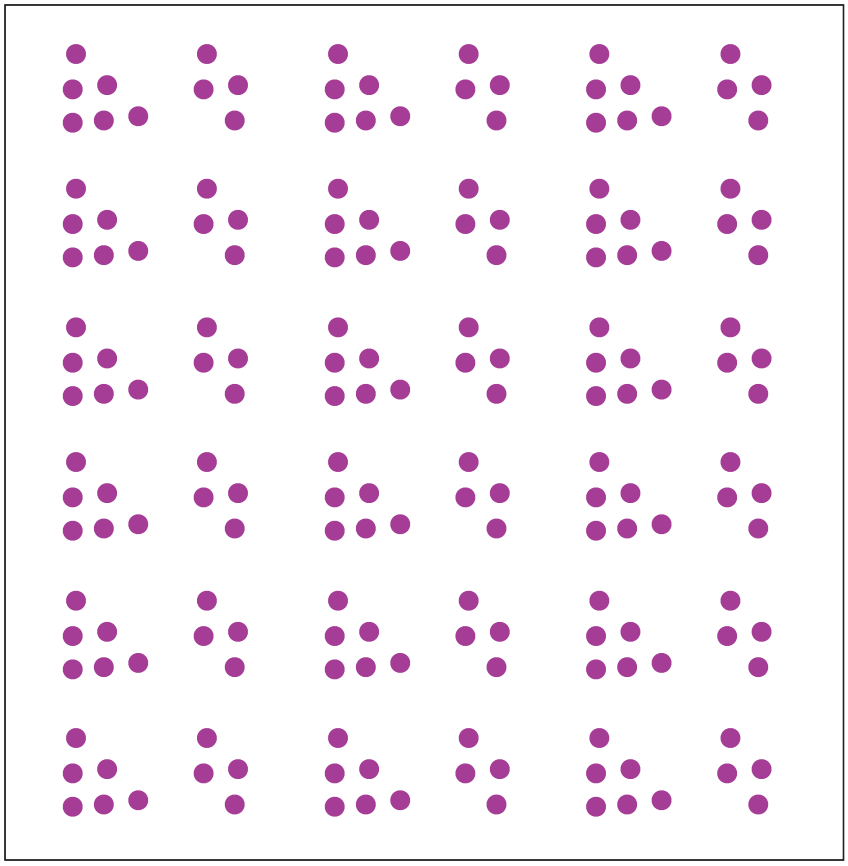
18. A teacher gives away 111 stickers from the amount shown below.



After the teacher gives away 111 stickers, how many stickers are left?

- ○ 535
- ○ 525
- ○ 515
- ○ 505

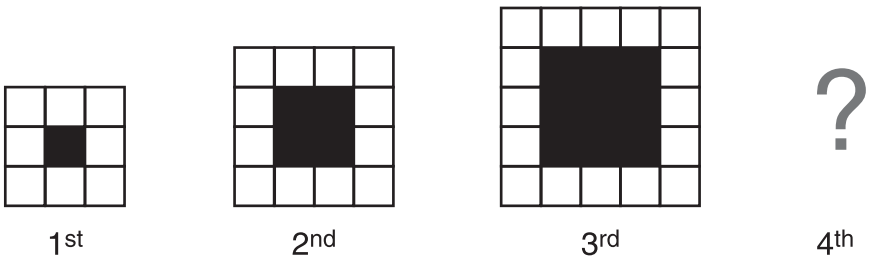
19. Alison looks at the design on a piece of art paper.



About how many dots are on the piece of art paper?

- ○ 360
- ○ 240
- ○ 175
- ○ 125

20.

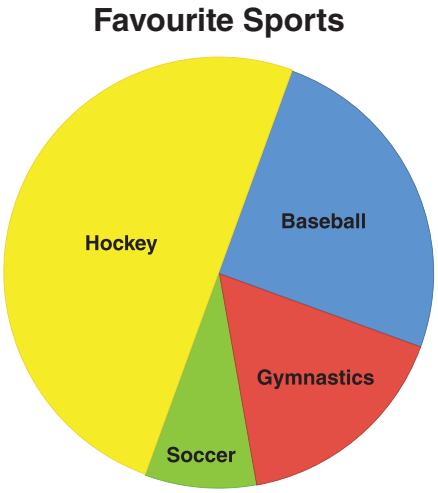


1st 2nd 3rd 4th

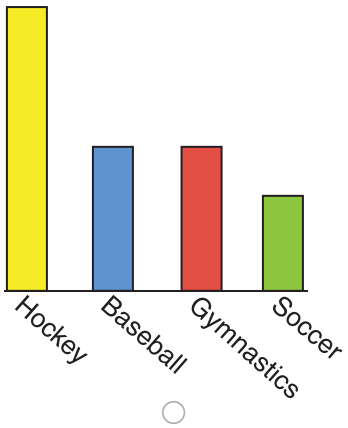
How many white squares will be in the 4th shape if the pattern continues?

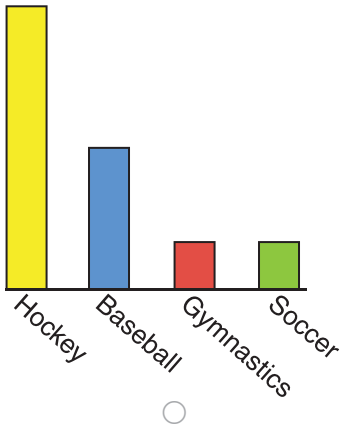
- ○ 14
- ○ 16
- ○ 18
- ○ 20

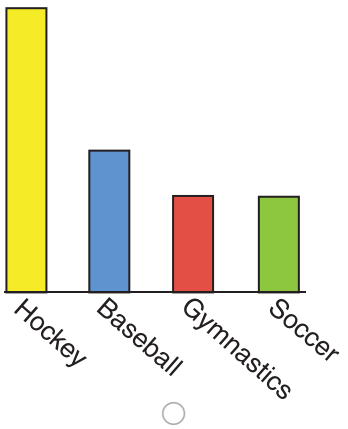
21. Students choose their favourite sports and record the results on the chart below.

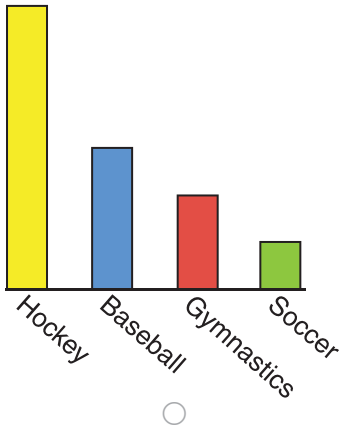


Which of the following graphs shows the same information as the chart?









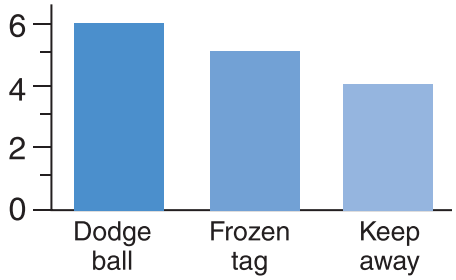
22. Some students vote for the game that they want to play.

Game Chosen	Number of Votes
Dodge ball	✓ ✓ ✓ ✓ ✓ ✓
Frozen tag	✓ ✓ ✓ ✓ ✓
Keep away	✓ ✓ ✓ ✓
Octopus	✓ ✓ ✓ ✓ ✓ ✓

✓ = 1 vote

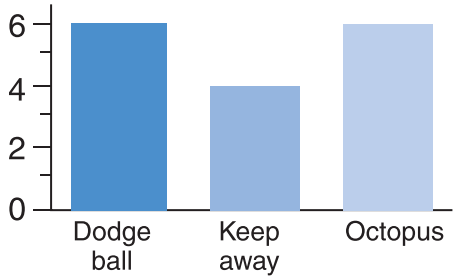
Which of the following bar graphs shows the three games that have the MOST votes?

Games Chosen



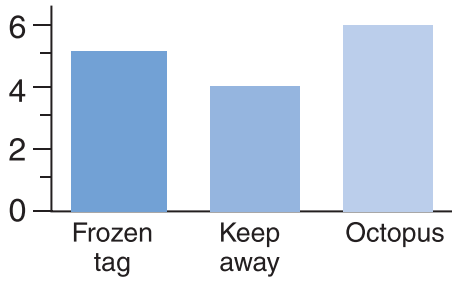
○

Games Chosen



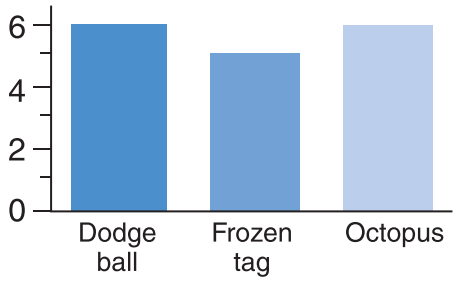
○

Games Chosen



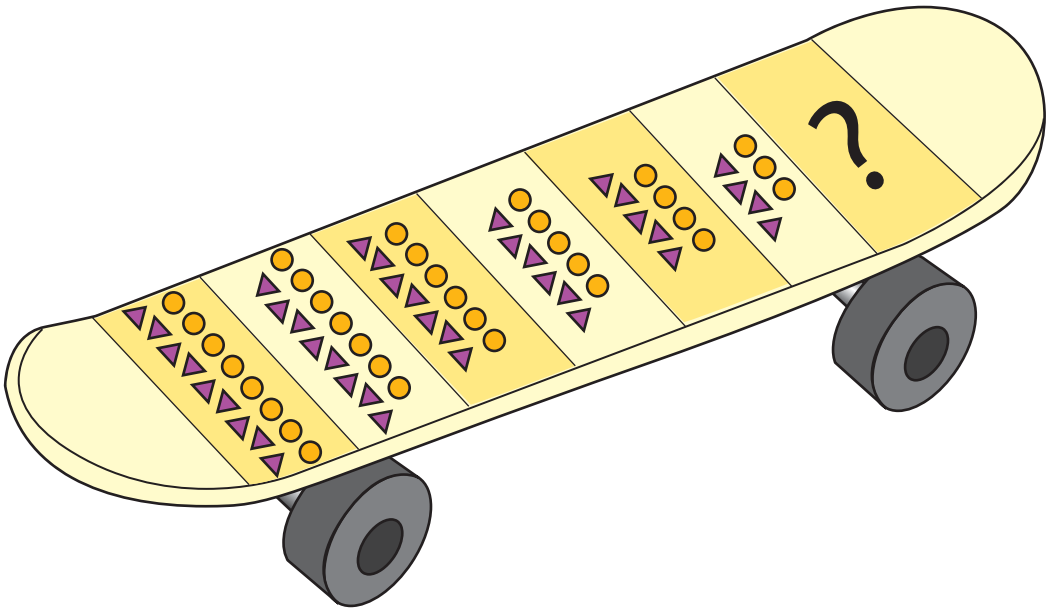
○

Games Chosen

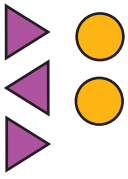


○

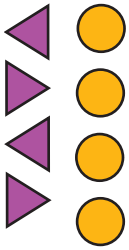
23. Mel makes a patterned design on the deck of his skateboard.



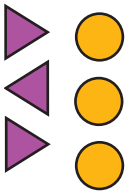
If the pattern continues, which of the following patterns would Mel use to complete the design on the skateboard shown above?



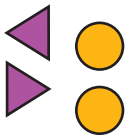
○



○

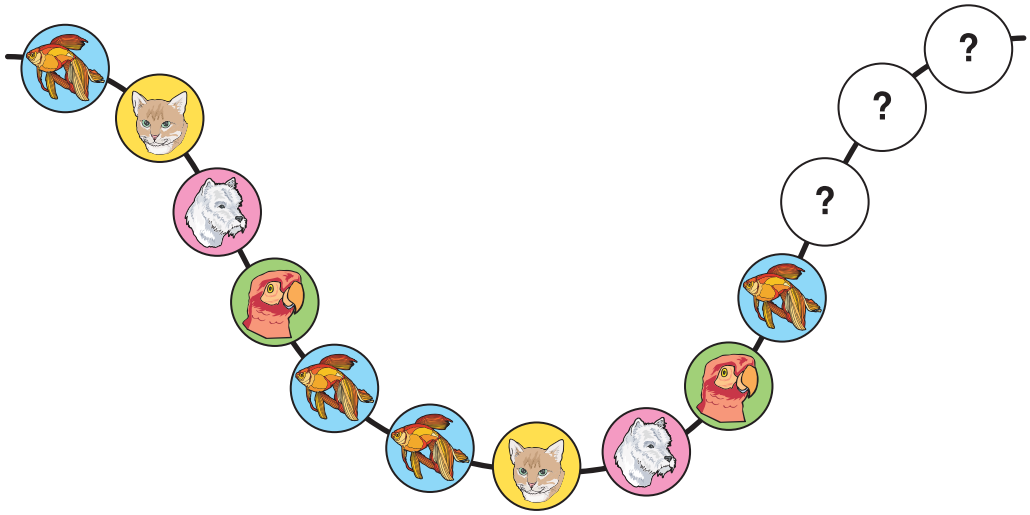


○



○

24. The beads on a necklace form the pattern shown below.



If the pattern continues, then the next three beads will be

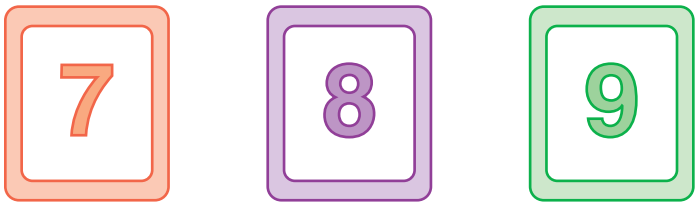
○

○

○

○

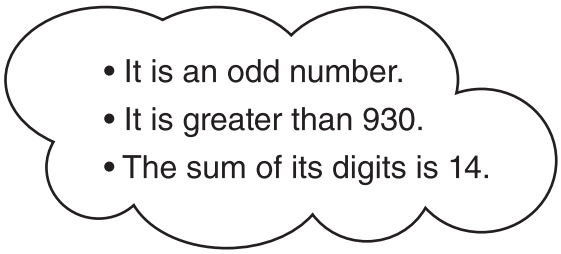
25. Sue makes 3-digit numbers using the numerals on the three cards shown below.



Which of the following 3-digit numbers has the GREATEST value with 9 in the tens position?

- ○ 987
- ○ 897
- ○ 879
- ○ 798

26. Read the following number clues.



Which of the following numbers could be the mystery number?

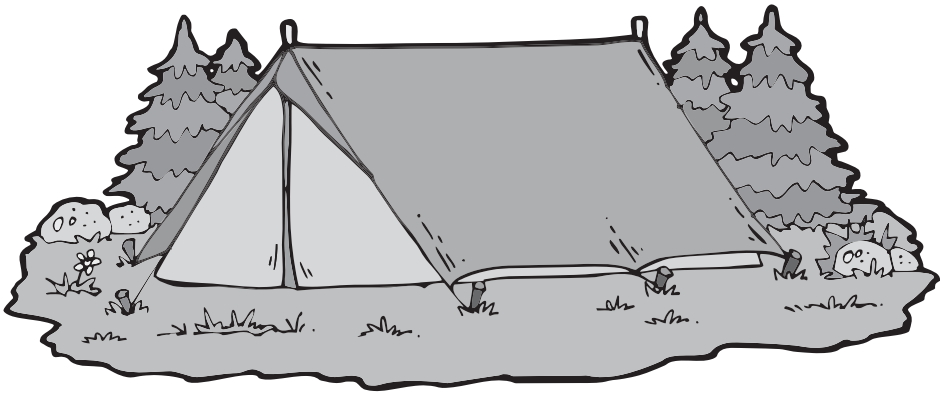
- ○ 923
- ○ 932
- ○ 931
- ○ 941

27. Sandy can earn points for each level she plays in a computer game.

Level	Points Earned
1	10
2	20
3	40
4	80
5	**?**

If the pattern of points earned continues, then how many points can Sandy earn for level 5?

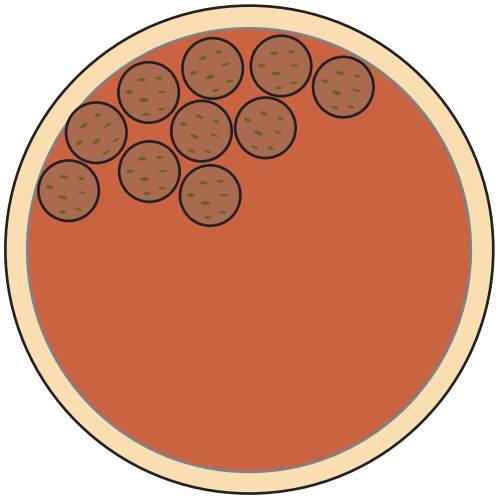
- ○ 100 points
- ○ 120 points
- ○ 150 points
- ○ 160 points



28. The tent shown above is an example of a prism that has faces in the shape of a

- ○ circle and a square
- ○ triangle and a square
- ○ rectangle and a circle
- ○ triangle and a rectangle

29. Sarah is placing pepperoni slices on a pizza.

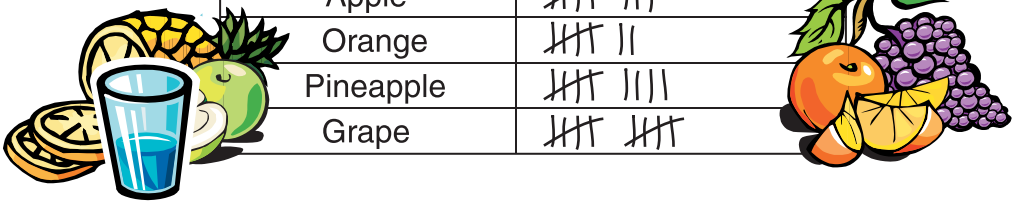


About how many pepperoni slices will Sarah need to cover the whole pizza without overlapping the slices?

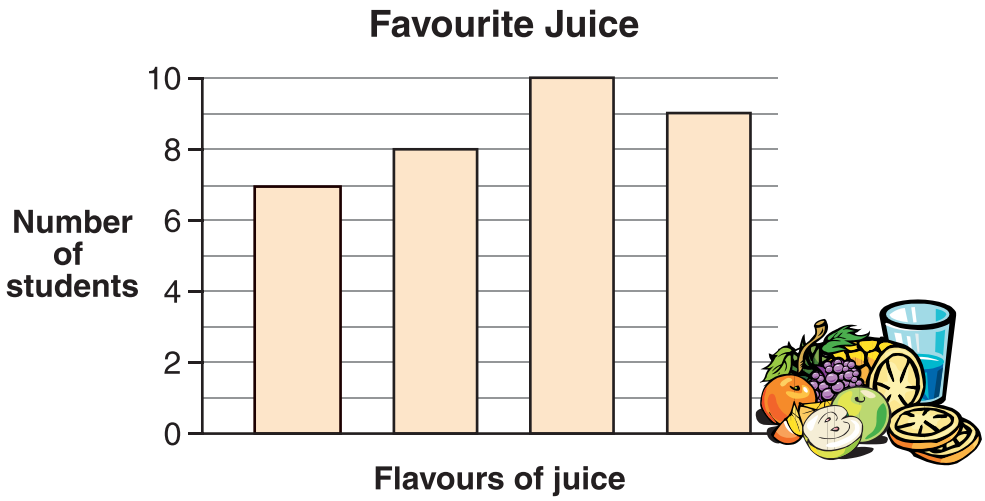
- ○ 20 slices
- ○ 35 slices
- ○ 65 slices
- ○ 80 slices

30. The results of a survey are shown on the following tally chart.

Favourite Juice	
Flavours of Juice	**Number of Students**
Apple	𝍸 |||
Orange	𝍸 ||
Pineapple	𝍸 ||||
Grape	𝍸 𝍸



The same results are shown on the following bar graph.



In order from left to right, the bars in the bar graph should be labelled

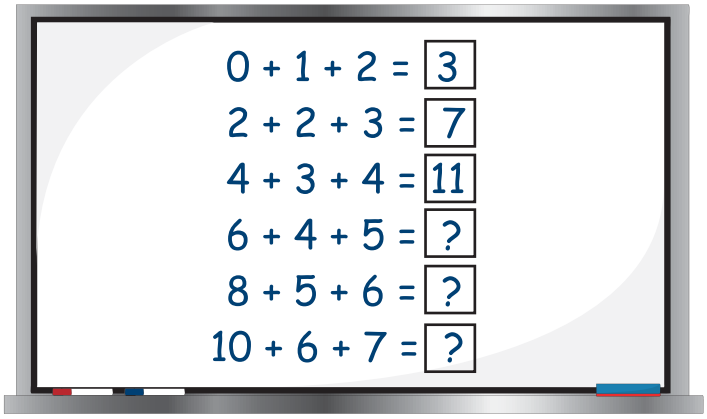
- ○ orange, apple, grape, pineapple
- ○ apple, orange, grape, pineapple
- ○ orange, apple, pineapple, grape
- ○ apple, orange, pineapple, grape

31. A teacher displays the number 146 on the flashcard shown below.

What is another way she could have written this number?

- ○ 1 + 4 + 6
- ○ 10 + 40 + 6
- ○ 100 + 4 + 6
- ○ 100 + 40 + 6

32. Mark writes a number pattern on the whiteboard. He asks Chelsea to put in the missing numbers.



Which group of numbers does Chelsea use to complete the pattern?

- ○ 13, 15, and 17
- ○ 13, 17, and 19
- ○ 15, 19, and 23
- ○ 15, 17, and 19

33. David puts a stack of books and some weights on a scale. Each book has a mass of 1 kg.

The scale balances when the mass of EACH weight is

- ○ 8 kg
- ○ 6 kg
- ○ 4 kg
- ○ 2 kg

34. There are 236 passengers on an airplane. The airplane has 315 seats.

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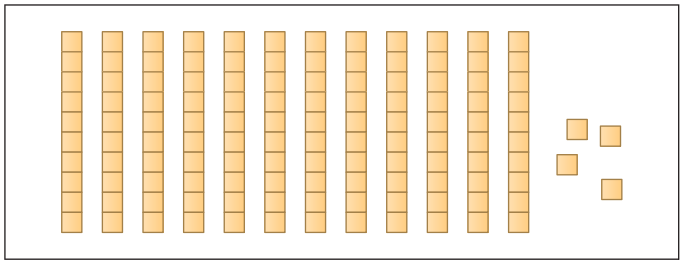
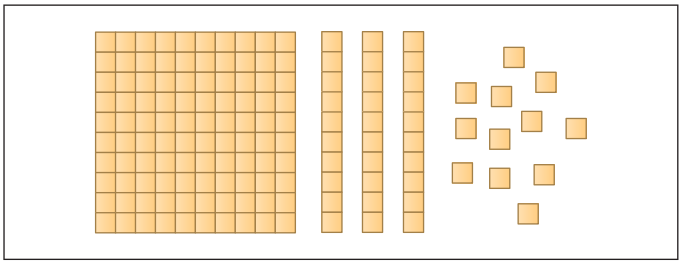
If all the passengers sit in their own seats, then the number of empty seats on this airplane is

- ○ 79
- ○ 89
- ○ 121
- ○ 551

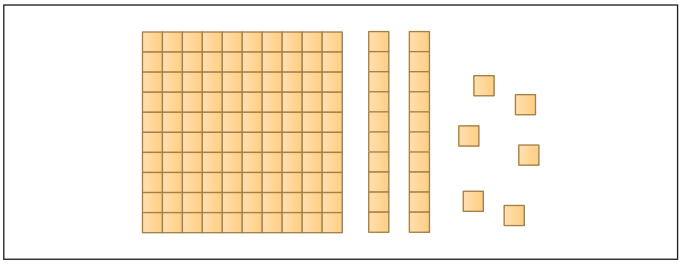
35. Julia represents four numbers using base ten blocks.



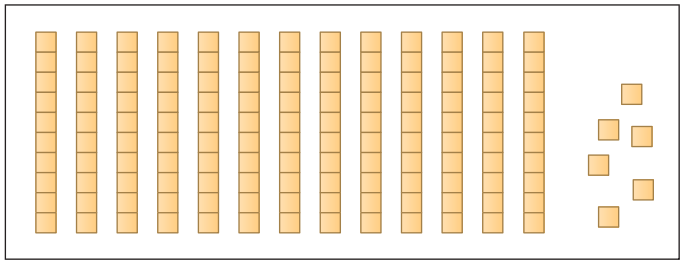
A



B



C



D

The two pictures that TOGETHER represent a sum of 260 are

- ○ A and B
- ○ A and D
- ○ B and C
- ○ C and D

36. Krista is making a Peruvian mask. She uses the following shapes:

5 triangles
7 quadrilaterals
4 hexagons

Which of the following masks is Krista's?

○

○

○

○

37. Donny is bringing his dog to school on Thursday, May 13. He is taking his dog to a farm 1 week and 3 days before he takes his dog to school.

MAY						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Using the calendar above, on what day will Donny take his dog to the farm?

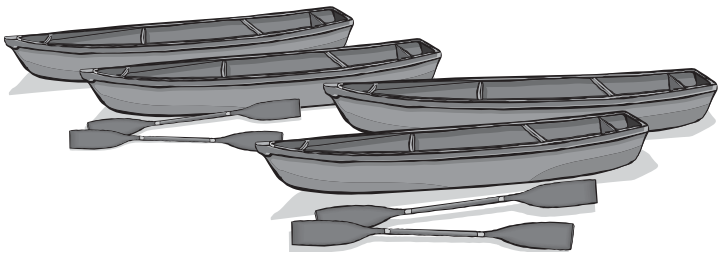
- ○ Monday, May 3
- ○ Thursday, May 6
- ○ Monday, May 10
- ○ Sunday, May 23

38. There are 18 skipping ropes in the gym. Andrew takes half of these skipping ropes outside. Then Kavi takes 6 of Andrew's skipping ropes back to the classroom.

After Kavi takes the 6 skipping ropes, how many skipping ropes does Andrew still have?

- ○ 12
- ○ 9
- ○ 6
- ○ 3

39. There are four canoes on the lake. Four children can ride in each canoe.



Which one of the following equations represents the number of children that can ride in the canoes?

- ○ 4 + 4 + 4 + 4 = 16
- ○ 4 + 4 + 4 = 12
- ○ 8 + 4 = 12
- ○ 16 + 4 = 20

40. A drop of water falls from a water faucet once every 3 seconds.

How many water drops will fall in 60 seconds?

- ○ 60
- ○ 30
- ○ 20
- ○ 10