



Preparation for the National Grade Six Assessment

Guide #3 | Mathematics Multiple Choice

Who are you?

If you are in grade 5 or 6 and will be taking the next National Grade Six Assessment, then this packet is for you. This packet has past exam questions which have been solved with explanations to help you learn how to solve similar questions. Completing this packet will increase your chances of passing the exam with the highest possible score.

Who are we?

This packet was created by the Caribbean Education Project, a team of students and teachers from universities in the United States and the Caribbean. Our goal is to help you with your preparations for the next exam and to help you better understand each topic. We want you to achieve your best score on the exam. If you are not clear on concepts after reading the material, ask your parent or guardian for help. If they cannot help, ask another family member or a friend. If no one can help you, then ask your parents to send us a message on Facebook or WhatsApp or e-mail us.

- To reach us through Facebook, go on Facebook and search for “Shawn Shivdat.” Then send me a message using Facebook Messenger.
- To reach us by WhatsApp, save this number “Shawn Shivdat, +1 404-406-9638” and message me on WhatsApp.
- To reach us by e-mail, send a message to this e-mail address: info@caribed.org.

Keep in contact

If you are using this packet to prepare, we would like to hear from you. Please keep in touch with us so we can help you with any questions you may have. We can also provide updates when future materials are posted. Send us your name and contact information through WhatsApp, Facebook Messenger, or e-mail (listed above), or send a picture of this sheet filled out through WhatsApp, Facebook Messenger, or e-mail.

Name: _____

Parent’s phone number: _____

Parent’s e-mail address: _____

**PLEASE SHARE THIS GUIDE WITH OTHERS WHO MAY BENEFIT
FROM USING IT.**



How to use this guide:

1. The following pages have a total of 40 past exam questions. Try to answer these questions in the prescribed 70 minutes. If you are not able to answer a question, skip it and go on to the next question. When you are done answering all the questions, you can return to the ones you are having trouble with during your remaining time.
2. It is okay if you were not able to answer all the questions correctly on your first try. Keep practicing the questions, and you will get better. Soon, you will be able to answer all the questions in the 70 minutes. (**TIP:** Practice makes you perfect, so keep practicing.)
3. Answers to all the questions are on the pages immediately after the practice test. When you finish answering the questions, compare your answers to the answers on these pages.
4. Mark the questions which you got wrong.
5. Read our guide to solving each question. Even for questions you got correct, read the explanations we provided because you will likely learn something from them. Our explanations provide valuable information which can provide you with additional tricks to solve other problems.
6. Always read the instructions for each question carefully before attempting to answer. Also, read the question itself carefully and pay attention to what the question is asking you to do before attempting to answer it.
7. We provide the answers to all the questions in the practice exams to help you. Do not look at the answers before you attempt the questions. If you look at the answers before, you will not learn a lot from this packet. So, do we have a deal? Okay, I heard you say yes.





MINISTRY OF EDUCATION
NATIONAL GRADE SIX ASSESSMENT
PRACTICE TEST
MATHEMATICS
PAPER 1
2010

Hey students, for the purposes of practice, you can ignore the instructions listed below about shading circles on an answer sheet. We have included that here so you will be familiar with these instructions on exam day.

1 hour and 10 minutes

READ THESE INSTRUCTIONS CAREFULLY BEFORE YOU ATTEMPT TO ANSWER THE QUESTIONS.

1. WRITE YOUR CANDIDATE NUMBER ON THE ANSWER SHEET AND UNDERLINE THE SUBJECT.
2. This test has **40** questions. You are required to answer **ALL** questions. Four responses are given for each question. The responses are **A, B, C** and **D**. Only **ONE** response is correct.
3. If you are not sure of the answer to a question, then choose the one which you think is **BEST**. On your answer sheet, shade the letter you have chosen.
4. **BE SURE THAT THE QUESTION NUMBER IN THE BOOKLET IS THE SAME AS THE ONE YOU HAVE USED ON YOUR ANSWER SHEET.**

Here is an example done for you.

1. The sum of 4 and 5 is

- | | | | |
|-----|-----|-----|-----|
| (A) | 1. | (B) | 9. |
| (B) | 20. | (D) | 45. |

ANSWER SHEET

1. A B C D

Note: the letter **B** is shaded on the answer sheet because **9**, the correct answer, is next to **B**.

5. If you make a mistake, erase the shaded letter cleanly, then shade the letter next to the answer you have now chosen.
6. **REMEMBER**, each answer **MUST** only be shown by the shading on your **Answer Sheet**.
7. Remember only **ONE** answer must be provided for each question.

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO.



1. What is the value of the underlined digit in 88 888?
- (A) 8 000 (B) 800
(C) 80 (D) 8

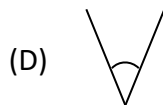
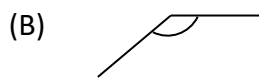
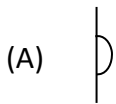
2. Which is a prime number?
- (A) 7 (B) 9
(C) 15 (D) 21

3. Which is a Roman Numeral?
- (A) * (B) 0
(C) 9 (D) X

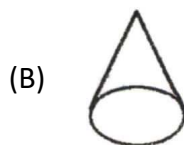
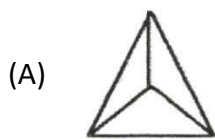
4. Angles are measured in
- (A) litres. (B) squares.
(C) degrees. (D) grams.

5. A multiple of 12 is
- (A) 1 (B) 2
(C) 21 (D) 24

6. Which is an acute angle?



7. Which of the following is a triangular base pyramid?



8. Which set is equal to donkeys that can fly?

(A) { }

(B) {bat}

(C) {eagle}

(D) {flying fish}

9. A subset of {A, B, C} is

(A) {A, C, D}

(B) {B, C, A}

(C) {B, A, E}

(D) {C, A, G}

10. Which one of the following represents a ratio relationship?

(A) $8 \div 5$

(B) 8:5

(C) 85%

(D) 8.5

Use **Figure 1** below to answer question 11.

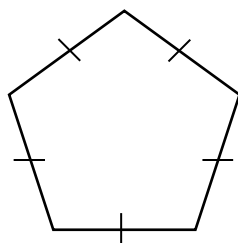


Figure 1

11. The formula for finding the perimeter for the regular pentagon in **Figure 1** is

(A) $2s$

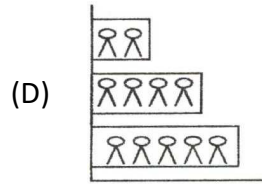
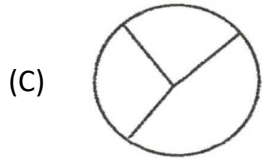
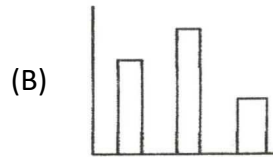
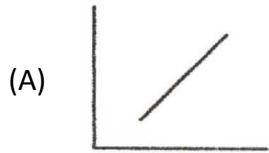
(B) $3s$

(C) $4s$

(D) $5s$



12. Which one represents a line graph?



Use **Figure 2** below to answer question 13

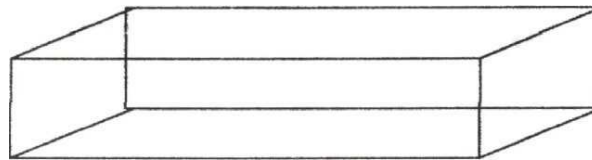


Figure 2

13. How many edges are in the cuboid above?

- (A) 4
- (B) 8
- (C) 12
- (D) 16

14. One **million** five **hundred** thousand two can be written as

- (A) 15 500 002
- (B) 1 502 000
- (C) 1 500 020
- (D) 1 500 002

15. $32.28 \div 100$ is

- (A) 0.3228
- (B) 3.228
- (C) 32.28
- (D) 322.8

16. Which of the following is equal to 90 450?

- (A) $900 + 400 + 50$
- (B) $9000 + 400 + 50$
- (C) $90\,000 + 400 + 50$
- (D) $90\,000 + 4000 + 50$



17. $\frac{2}{3} \times \frac{4}{7} =$

(A) $\frac{6}{10}$

(B) $\frac{18}{14}$

(C) $\frac{8}{10}$

(D) $\frac{8}{21}$

18. Which digits will complete the quotient in the division sum below?

$$\begin{array}{r} 7 \\ 8 \overline{) 5679} \\ \underline{-56} \\ 07 \end{array}$$

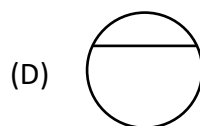
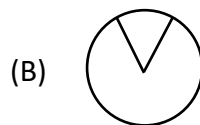
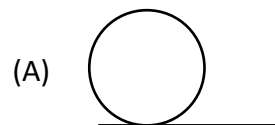
(A) 7 0 9

(B) 0 9 7

(C) 9 7

(D) 0 9

19. Which diagram shows the chord of the circle?



20. 6.579 m expressed in centimetres is

(A) 0.6579

(B) 65.79

(C) 657.9

(D) 6579

Use **Figure 3** below to answer question 21.

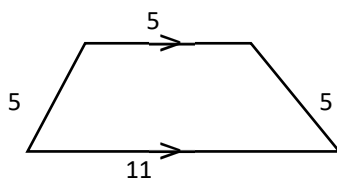


Figure 3

21. The **perimeter** of the shape in **Figure 3** is

(A) 10

(B) 15

(C) 26

(D) 65



22. How many whole numbers are in the set of numbers greater than 104 but less than 110?
- (A) 3 (B) 4
(C) 5 (D) 6

Study the Venn diagram in **Figure 4**, then answer question 23

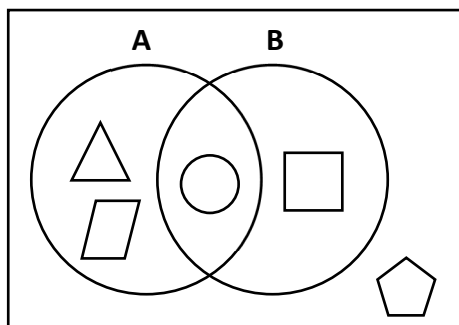


Figure 4




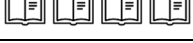
23. Which element is in neither **A** nor **B**?

- (A)  (B) 
(C)  (D) 

24. 425% expressed as a decimal is

- (A) 4.25 (B) 42.5
(C) 425 (D) 0.425

Use the pictograph for Questions 25 and 26.

Number of Books Read	
Mystery	
Biography	
Animal Stories	
History	

Each  stands for 5 books.



25. How many more mysteries than animal stories were read?
(A) 2 (B) 5
(C) 10 (D) 13
26. How many more history books need to be read to equal the number of biographies read?
(A) 5 (B) 27
(C) 20 (D) 9
27. Look at the number pattern below. What is the next number likely to be?
72, 63, 54, 45, _____
(A) 36 (B) 27
(C) 18 (D) 9
28. Roy arrived at school sports at 10:30 hours and spent 3 hours 45 minutes. At what time did he leave?
(A) 14:45 hours (B) 14:15 hours
(C) 10:45 hours (D) 10:30 hours
29. The smallest number that can be divided by 6, 9, and 12 and leaving a remainder of 1 is
(A) 28 (B) 36
(C) 73 (D) 145

Use **Figure 5** below to answer question 30.

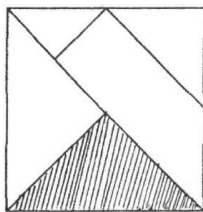


Figure 5

30. What fraction of the whole shape in **Figure 5** is shaded?
(A) $\frac{1}{16}$ (B) $\frac{1}{8}$
(C) $\frac{1}{4}$ (D) $\frac{1}{2}$



31. The volume of a box = area of base x height.
If the volume of a box is 400 cm^3 and the area of the base is 40 cm^2 , what is the height in cm of the box?
- (A) 10 (B) 40
(C) 400 (D) 16 000
32. If 900 is increased by 30%, then the new number would be
- (A) 270 (B) 630
(C) 1170 (D) 90 030

Use the diagram below to answer question 33.

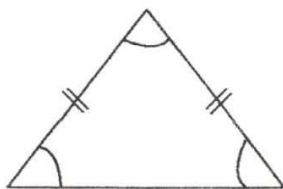


Figure 6

33. In the isosceles triangle above, the base angles are 72° each. What is the size of the third angle?
- (A) 36° (B) 72°
(C) 144° (D) 180°

Use **Figure 7** below to answer question 34.

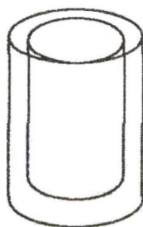


Figure 7

34. The diagram in **Figure 7** represents a piece of pipe. The radius of the outer circle of the pipe is 10.5 cm and the radius of the inner circle is 5.4 cm. What is the thickness of the pipe?
- (A) 4.1 cm (B) 5.1 cm
(C) 15.4 cm (D) 15.9 cm



Use the Venn diagram in **Figure 8** to answer questions 35 and 36.

In the Venn diagram below:

Set **A** has 15 girls with long hair

Set **B** has 18 girls with blue ribbon

6 girls have neither long hair nor blue ribbon

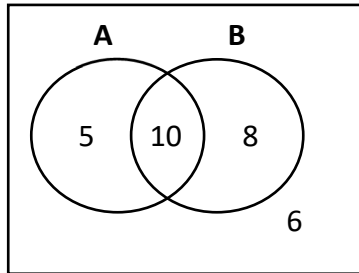


Figure 8

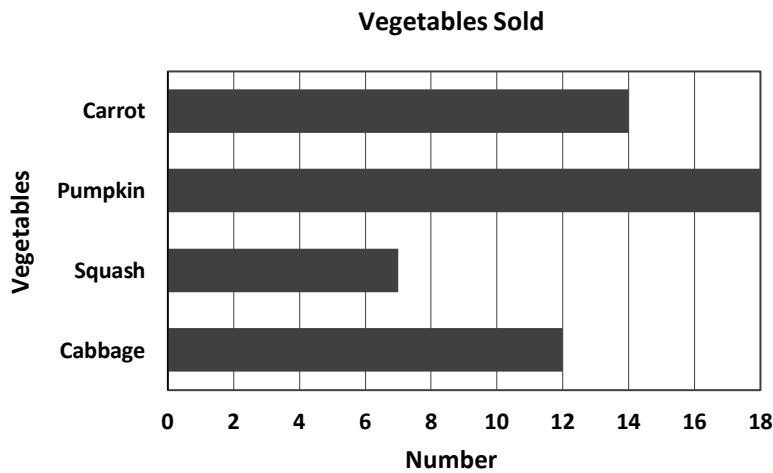
- 35.** Set **A** intersect set **B** can be described as all girls with
- (A) neither long hair nor blue ribbons (B) long hair and blue ribbons
(C) with ribbons (D) long hair
- 36.** How many girls have neither long hair nor blue ribbon?
- (A) 10 (B) 8
(C) 6 (D) 5
- 37.** Lisa shared 120 stickers with her two sisters in the ratio 4:3:1. How many stickers make up the largest share?
- (A) 128 (B) 60
(C) 45 (D) 15





- 38.** The marked price for the dress above was \$13 000. If 16% VAT is calculated on the marked price, what amount was paid for the dress?
- (A) \$208 (B) \$2080
(C) \$11 920 (D) \$15 080

Use the graph below to answer questions 39 and 40.



- 39.** Amelia picks and then sells vegetables from her garden at a roadside stand. How many cabbages were sold?
- (A) 6 (B) 8
(C) 10 (D) 12
- 40.** How many more pumpkins than squash did Amelia sell?
- (A) 9 (B) 10
(C) 11 (D) 12

END OF TEST



ANSWER EXPLANATIONS

QUESTION 1 ANSWER EXPLANATION

1. What is the value of the underlined digit in 88 888?
- (A) 8 000 (B) 800
(C) 80 (D) 8

This question requires us to know that when we read a number from right to left, each position we move to the left requires us to add that many zeroes to the positions afterwards. Describing this in a sentence may sound confusing, but this is really another way of discussing numbers in expanded form (also called expanded notation).

The diagram below should help explain what that means:

T E N	T H O U S A N D S	H U N D R E D S	T E N S	O N E S
8	8	8	8	8

88 888
written in expanded form is
 $80\,000 + 8000 + \underline{800} + 80 + 8$

Answer choice B is correct.

QUESTION 2 ANSWER EXPLANATION

2. Which is a prime number?
- (A) 7 (B) 9
(C) 15 (D) 21

This question is testing whether you understand the definition of a prime number. A prime number is any number greater than 1 that has only two factors, one and itself. Factors are smaller numbers that you can multiply to get a given number. If we consider all the factors that contribute to each answer choice, we see the following:

answer choice A	(1×7)	answer choice B	$(1 \times 9), (3 \times 3)$
answer choice C	$(1 \times 15), (3 \times 5)$	answer choice D	$(1 \times 21), (3 \times 7)$

Answer choice A is the only option that has no factors other than multiplying itself x 1. **Answer choice A is correct.**

QUESTION 3 ANSWER EXPLANATION

3. Which is a Roman Numeral?
- (A) * (B) 0
(C) 9 (D) X

The Hindu-Arabic numeral system which uses the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 is the most widely used numeral system in the world. These symbols are used to represent a number of something. For example, if you have nine apples, you can represent this quantity using the symbol 9. Answer choices B and C are incorrect. Answer choice A is incorrect because it is an asterisk, not a numeral. This question is specifically asking about the Roman numeral system; this system is not as commonly used and utilizes the symbols I, V, X, L, C, D, M. From the answer options given, the only Roman numeral that appears is X. **Answer choice D is correct.**



QUESTION 4 ANSWER EXPLANATION

4. Angles are measured in

- (A) litres. (B) squares.
(C) degrees. (D) grams.

This question is testing your ability to identify the correct units of measurement. Answer choice **A** is incorrect because litres are a units used to measure the volume of liquids. For example, your water bottle when filled has about half a litre of water. Answer choice **B** is incorrect because squares are used to measure the area of a given surface. Answer choice **D** is incorrect because grams are a measurement of small masses like the mass of an apple. An angle is the space between two intersecting lines and is usually measured in units called degrees. A degree (°) is the unit of measurement for angles. For example, a full circle is 360°, and a line is 180°. The right angle of a square is 90°. **Answer choice C is correct.**

QUESTION 5 ANSWER EXPLANATION

5. A multiple of 12 is

- (A) 1 (B) 2
(C) 21 (D) 24

A multiple of a given number is the answer you get when you multiply that number with another whole number. Using 12 as our example, we would look at the products of 12x1, 12x2, 12x3, 12x4, etc. The products would be 12, **24**, 36, 48, etc.





Another way of thinking about multiples: when you divide a multiple of a given number by that number, you get a whole number. You do not get a remainder. To illustrate this point, in using the four answer options and dividing each by 12, we would have:

answer choice A	answer choice B	answer choice C	answer choice D
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{21}{12}$	$\frac{24}{12}$
does not give a whole number	does not give a whole number	does not give a whole number	simplifies to 2, a whole number

Answer choice D is correct.

QUESTION 6 ANSWER EXPLANATION

6. Which is an acute angle?

- (A) 
- (B) 
- (C) 
- (D) 

An acute angle is an angle that is **less** than 90 degrees (recall that a right angle is defined as being 90°). Answer choice **A** appears to be showing the angle of a line which is 180°. Answer choice **B** is showing an angle that is definitely greater than 90°. Answer choice **C** is an actual right angle; the symbol used to indicate the angle size is not round, it is square, and the square communicates a 90° right angle. Answer choice **D** is the one angle that is less than 90°, so **answer choice D is correct.**



QUESTION 7 ANSWER EXPLANATION

7. Which of the following is a triangular base pyramid?



This question is testing your knowledge on 3-dimensional geometric shapes. A **pyramid** is a polyhedron that has a base, which can be any polygon, and three or more triangular faces that meet at a point called the **apex**. An apex is the highest point of certain shapes and is usually located at a vertex. So what is a vertex? A **vertex** is a single point where two or more lines, curves, or sides meet. The apex is located directly at the highest point above or opposite the bottom of the shape called a **base**.

Using this definition, answer choices **B** and **D** can be eliminated because they do not have three or more triangular faces meeting at an apex. Note that the figure in answer choice **D** has only two triangular faces. In fact, the shape in answer choice **D** is a triangular prism, and the shape in answer choice **B** is a cone.

Answer choices **A** and **C** are both pyramids, but we need to identify the pyramid with a triangular base. The base is furthest away from the apex, and in answer choice **C**, we see the base is a square. Answer choice **C** is incorrect because it is a square pyramid. **Answer choice A is the correct answer**; it is a triangular pyramid (also called a tetrahedron).

QUESTION 8 ANSWER EXPLANATION

8. Which set is equal to donkeys that can fly?

(A) { }

(B) {bat}

(C) {eagle}

(D) {flying fish}

This question is testing whether you understand the definition of an empty set. An empty set is a set without any members in it. The set for donkeys that can fly is an empty set because donkeys cannot fly. For this reason, the set should have no members. An empty set can be represented using two empty curly brackets as shown in answer choice **A**. **Answer choice A is correct**.

QUESTION 9 ANSWER EXPLANATION

9. A subset of {A, B, C} is

(A) {A, C, D}

(B) {B, C, A}

(C) {B, A, E}

(D) {C, A, G}

A subset is a set whose elements are **all** found in another set. This means as soon as an answer choice contains a value that is not listed in the original set of {A, B, C}, the answer choice is not a subset of {A, B, C}. The symbol we use to show a set is **not** considered a subset is \notin .

Answer choice **A** is eliminated because it contains element D. Answer choice **C** is eliminated because it contains the element E. Answer choice **D** is eliminated because it contains element G. **Answer choice B is correct** because every element in that set is an element in the original set. *The order in which the numbers (the elements) are listed is not important.*

QUESTION 10 ANSWER EXPLANATION

10. Which one of the following represents a ratio relationship?

(A) $8 \div 5$

(B) 8:5

(C) 85%

(D) 8.5



A ratio is a relationship between two quantities. For example, if there are 8 girls and 5 boys in your classroom, then the ratio of girls to boys in your classroom would be 8 to 5 (note that the order in which this is presented is important). This relationship is typically represented with a colon (:). For the example of the ratio of girls to boys in your classroom, the relationship would be written as 8:5. Of the four answer options presented, only answer choice **B** expresses a ratio. **Answer choice B is correct answer.**

Use **Figure 1** below to answer question 11.

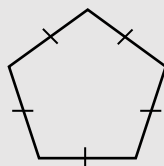


Figure 1

QUESTION 11 ANSWER EXPLANATION

11. The formula for finding the perimeter for the regular pentagon in **Figure 1** is

- (A) $2s$
- (B) $3s$
- (C) $4s$
- (D) $5s$

The perimeter is the measurement of the distance around a two-dimensional shape. A pentagon is a shape with 5 sides, and by calling it a regular pentagon, that means all the sides are the same length. To calculate the perimeter for any polygon, we simply add up the lengths of all the sides; to calculate the perimeter of a regular polygon, we can simply multiply the length of one side times the number of sides in the polygon. If we let s = the length of a side, we can calculate the perimeter of this regular pentagon by using the formula $5s$. **Answer choice D is correct.**

QUESTION 12 ANSWER EXPLANATION

12. Which one represents a line graph?



Answer choice **B** shows a bar chart. A bar chart can be used to represent information in groups shown by each bar. Answer choice **C** shows a pie chart. A pie chart can be used to show the contribution of different groups compared with each other. Answer choice **D** shows a pictograph. A pictograph uses images to show information. Answer choice **A** shows a line graph. A line graph can be used to show how a quantity changes with time. **Answer choice A is correct.**

Use **Figure 2** below to answer question 13

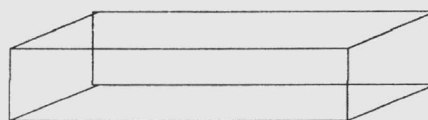


Figure 2

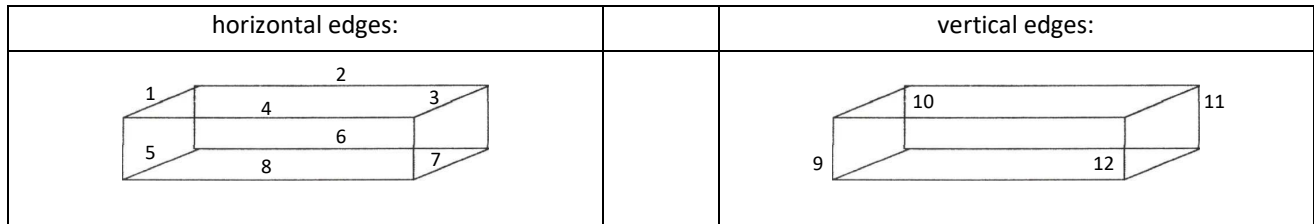
QUESTION 13 ANSWER EXPLANATION

13. How many edges are in the cuboid above?

- (A) 4
- (B) 8
- (C) 12
- (D) 16



Each line segment in the 3-dimensional shape above represents an edge. So, to find the total number of edges, we simply count the number of individual line segments. The correct answer is 12, so **answer choice C is correct**.



QUESTION 14 ANSWER EXPLANATION

- 14.** One **million** five **hundred** thousand two can be written as
- (A) 15 500 002 (B) 1 502 000
 (C) 1 500 020 (D) 1 500 002

A number that starts out saying “one million . . .” is a 1 with six numbers after it. This eliminates answer choice **A**. Five hundred thousand is a 5 with five numbers after it, so answer choices **B**, **C**, and **D** all satisfy that need. The final part that says “two” means we need the number 2 in the very last position (the “ones” position). **Answer choice D is correct.** You could also work the answer out by writing out the individual numbers that were expressed in text form, then adding them together as illustrated in the box to the right.

$ \begin{array}{r} 1\,000\,000 \\ 500\,000 \\ + \quad \quad 2 \\ \hline 1\,500\,002 \end{array} $

QUESTION 15 ANSWER EXPLANATION

- 15.** $32.28 \div 100$ is
- (A) 0.3228 (B) 3.228
 (C) 32.28 (D) 322.8

Dividing by factors of 10 (example: 10, 100, 1000) allows us to move the decimal point to the left the same number of positions as we have zeros in the factor. If we need to move the decimal more positions than we have numbers to the left of the decimal, we will need to write in additional zeros between the new position of the decimal point and what was originally shown as the first number.

In this example using the number 32.28, there are two numbers to the left of the decimal. If we were to move the decimal point 3 or more positions to the left, we would need to add in extra zeros.

$32.28 \div 10 = 3.228$	10 has 1 zero after the 1, we move the decimal over 1 position to the left.
$32.28 \div 100 = 0.3228$	100 has 2 zeros after the 1, we move the decimal over 2 positions to the left.
$32.28 \div 1000 = 0.03228$	1000 has 3 zeros after the 1, we move the decimal over 3 positions to the left. Note that we need to write in an additional zero after the decimal, but before the number 3.

Answer choice D is correct.

QUESTION 16 ANSWER EXPLANATION

- 16.** Which of the following is equal to 90 450?
- (A) $900 + 400 + 50$ (B) $9000 + 400 + 50$
 (C) $90\,000 + 400 + 50$ (D) $90\,000 + 4000 + 50$



Expanded form or expanded notation is a way of writing numbers to see the math value of individual digits.

For the number presented to us, 90 450, we can think of it like this:

T E N	T H O U S A N D S	H U N D R E D S	T E N S	O N E S
9	0	4	5	0

$$90\,450$$

written in expanded form is

$$90\,000 + 0000 + 400 + 50 + 0$$

- or -

$$90\,000 + 400 + 50$$

Answer choice C is correct.

QUESTION 17 ANSWER EXPLANATION

17. $\frac{2}{3} \times \frac{4}{7} =$

- (A) $\frac{6}{10}$
 (C) $\frac{8}{10}$

- (B) $\frac{18}{14}$
 (D) $\frac{8}{21}$

To answer this question, you need to know how fractions are multiplied. Given any two fractions $\frac{a}{b}$ and $\frac{c}{d}$, we get an answer in fraction form that shows the products of the numerators multiplied by each other over the products of the denominators multiplied by each other. This would result in the following:

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

Using this information, we get the following:

$$\frac{2}{3} \times \frac{4}{7} = \frac{8}{21}$$

Answer choice D is correct.

QUESTION 18 ANSWER EXPLANATION

18. Which digits will complete the quotient in the division sum below?

$$\begin{array}{r} 7 \\ 8 \overline{)5679} \\ \underline{-56} \\ 07 \end{array}$$

- (A) 709
 (B) 097
 (C) 97
 (D) 09



For division, the number which is divided is called the dividend (in this example, that is 5679), the number which divides is called the divisor (in this example, that is 8), and the number which is the result of the division is called the quotient. If there is any number left over, it is called the remainder.

We are given a long division problem that has already been partially solved and we need to fill in the remaining numbers that give us the quotient. The problem has already shown us that 8 goes into 56 a total of 7 times, and then we subtract $7 \times 8 = 56$ from the dividend to get 0 before we drop the 7 down (our digit in the tens column) and now take it from there.

We've been dropped into the problem at the point where we need to write the number of times 8 will go into 7 without going over. That would be zero, so we write in 0 on the top line above the tens column. When we write a 0 in the quotient, we then "drop down" the next digit from the dividend which in this case is the final digit, the number 9.

$$\begin{array}{r} 70 \\ 8 \overline{) 5679} \\ \underline{-56} \\ 079 \end{array}$$

We now determine how many times 8 will go into 79 without going over. That would be 9 times because $9 \times 8 = 72$, but 10×8 would be 80 and would go over the 79. We write 9 as part of the quotient above the ones column

$$\begin{array}{r} 709 \\ 8 \overline{) 5679} \\ \underline{-56} \\ 079 \end{array}$$



Now write 9 on top.

If we then subtracted $9 \times 8 = 72$ from the 79 we have in the long division running total, we would end up with 7 as a remainder.

$$\begin{array}{r} 709 \\ 8 \overline{) 5679} \\ \underline{-56} \\ 079 \\ \underline{-72} \\ 7 \end{array}$$



That 7 at the bottom is the remainder. That number needs to be a number that is smaller than the divisor.

The problem initially asked us "Which digits will complete the quotient in the division sum?", and now we see the answer is a 0 and a 9. **Answer choice D is correct.**

QUESTION 19 ANSWER EXPLANATION

19. Which diagram shows the chord of the circle?



For this question, you need to know that a chord is a straight line that connects two points on a circle. This line cannot go beyond the boundaries of the circle; when it does, it is no longer a chord but rather a secant.

Answer choice **A** is incorrect because it shows a tangent line. A tangent line touches the circle at only one point and is located outside of the circle. Answer choice **B** shows two lines from the center to the perimeter of the circle; these lines are called a radius. Answer choice **C** shows a single radius. **Answer choice D is correct** because it shows a single straight line that connects two separate points on the perimeter of the circle and stays completely within the circle.



QUESTION 20 ANSWER EXPLANATION

20. 6.579 m expressed in centimetres is

- (A) 0.6579 (B) 65.79
(C) 657.9 (D) 6579

The prefix “centi” means 100. You should know that 100 centimetres equals 1 metre. Centimetres and metres are among the units used to measure how long something is. For shorter lengths we would use centimetres and for longer lengths we can use metres. To convert metres to centimetres, you have to multiply by 100.

In this question you are given the decimal number 6.579 metres. To convert this number to centimetres, you would need to multiply it by 100. When multiplying a number by a multiple of 10 such as 100, simply move the decimal point to the right by the number of zeros in the multiple of 10. 100 has two zeros, so you move the decimal point to the right two times to get 657.9 centimetres.

Answer choice C is correct.

Use **Figure 3** below to answer question 21.

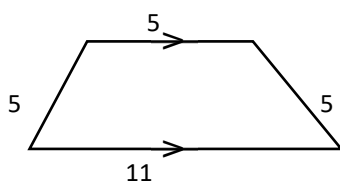


Figure 3

QUESTION 21 ANSWER EXPLANATION

21. The **perimeter** of the shape in **Figure 3** is

- (A) 10 (B) 15
(C) 26 (D) 65

Perimeter always means the total length when we add together all the sides of a shape. The figure above is a polygon (specifically, a trapezium as indicated by the arrows showing us there are two parallel sides) and we get a total of 26 when we add the four sides together ($5 + 5 + 5 + 11 = 26$). **Answer choice C is correct.**

QUESTION 22 ANSWER EXPLANATION

22. How many whole numbers are in the set of numbers greater than 104 but less than 110?

- (A) 3 (B) 4
(C) 5 (D) 6

A whole number is a number without a fraction or digits after a decimal point. 101 is a whole number but $100\frac{1}{2}$ and 100.02 are not.

To answer this question, start by listing all the numbers from 104 to 110: that would be 104, 105, 106, 107, 108, 109, and 110. Now the question says the numbers in this set should be greater than 104 and less than 110. So, you need to remove 104 and 110 from the list. This should leave you with the set {105, 106, 107, 108, 109}. If you count the members in this set, you see there are 5 members. **Answer choice C is correct.**



Study the Venn diagram in **Figure 4**, then answer question 23

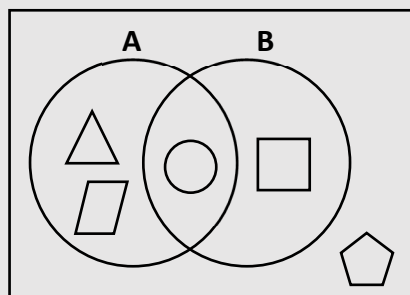


Figure 4

QUESTION 23 ANSWER EXPLANATION

23. Which element is in neither **A** nor **B**?

- (A)
- (C)

- (B)
- (D)

In the Venn diagram shown, the complete circle on the left shows all the members of set **A** and the complete circle on the right shows all members of set **B**. Rewriting set **A** and set **B** using curly brackets we get:

$$A = \{ \triangle \quad \parallel \quad \bigcirc \} \qquad B = \{ \bigcirc \quad \square \}$$

We're asked to identify which shape (which element) is in neither set **A** nor **B**; the answer is the pentagon. **Answer D is correct.**

QUESTION 24 ANSWER EXPLANATION

24. 425% expressed as a decimal is

- (A) 4.25
- (B) 42.5
- (C) 425
- (D) 0.425

425% is an example of a percentage. The symbol % in a percentage means divided by 100, so to convert this number to a decimal, you have to divide 425 by 100. As discussed in the solution for question 15, when we divide by 100, we move the decimal point over 2 positions to the left. This means 425 (which is really 425.) becomes 4.25, so **answer choice A is correct.**

Use the pictograph for Questions 25 and 26.

Number of Books Read	
Mystery	
Biography	
Animal Stories	
History	

Each stands for 5 books.



QUESTION 25 ANSWER EXPLANATION

25. How many more mysteries than animal stories were read?
- (A) 2 (B) 5
(C) 10 (D) 13

If we simply look at the pictograph and see images of 8 mystery books and 6 animal story books, then choose answer choice **A** that says 2 more mysteries were read than animal stories, we get the problem wrong. We get it wrong because the pictograph states that each image of a book actually represents 5 books; we need to take this difference of 2 book images and multiply it by 5 in order to get the correct answer of 10. **Answer choice C is correct.**

Another equally correct way to have solved this would have been to multiply the 8 mystery books by 5 to get 40, then multiply the 6 animal story books by 5 to get 30, and then finally subtract 30 from 40 to get the total of 10.

QUESTION 26 ANSWER EXPLANATION

26. How many more history books need to be read to equal the number of biographies read?
- (A) 5 (B) 27
(C) 20 (D) 9

Using the approach discussed in the question 25 explanation, we see biography shows 5 book symbols while history shows 4 book symbols. History needs one more book symbol to equal biography. Since a book symbol = 5 books, **answer choice A is correct.**

QUESTION 27 ANSWER EXPLANATION

27. Look at the number pattern below. What is the next number likely to be?
- 72, 63, 54, 45, _____
- (A) 36 (B) 27
(C) 18 (D) 9

To answer this question, you need to identify what you need to do to get the next number in the series. What change took place going from 72 to 63? From 63 to 54? From 54 to 43?

The numbers keep getting smaller, so the next number should be lower than 45. All the answer choices have numbers lower than 45, so we cannot eliminate any choices. Start by subtracting the second number in the series from the first number; this gives the equation $72 - 63 = 9$. Doing the same for each set of consecutive numbers gives us the same difference of 9 as we calculate $63 - 54 = 9$ and then $54 - 45 = 9$. We have our pattern! The next number should be 9 less than 45, so we calculate $45 - 9 = 36$. **Answer choice A is correct.**

QUESTION 28 ANSWER EXPLANATION

28. Roy arrived at school sports at 10:30 hours and spent 3 hours 45 minutes. At what time did he leave?
- (A) 14:45 hours (B) 14:15 hours
(C) 10:45 hours (D) 10:30 hours

There are a few different ways we could solve this. The problem says Roy spent 3 hours and 45 minutes at school sports, so we could take the starting time of 10:30, add 3 hours to that to get up to 13:30, then, with the remaining 45 minutes to add, we could first add 30 to get to an even 14:00, then add in the final 15 minutes to get to 14:15 hours. **Answer choice B is correct.**

Another way we could solve this is to say 3 hours and 45 minutes is 15 minutes less than 4 hours. We could have added four hours to the start time and gone from 10:30 to 14:30, then subtracted 15 minutes to get back to 14:15.



QUESTION 29 ANSWER EXPLANATION

29. The smallest number that can be divided by 6, 9, and 12 and leaving a remainder of 1 is

- (A) 28 (B) 36
(C) 73 (D) 145

To answer this question, start by listing the multiples of 6, 9, and 12 as shown below:

6	6, 12, 18, 24, 30, 36 , 42, 48, 54, 60, 66, 72 , 78, ...
9	9, 18, 36 , 45, 54, 63, 72 , 81, ...
12	12, 24, 36 , 48, 60, 72 , 84, ...

The common multiples across all three numbers are shown in bold. To get a remainder of 1, you would need to add 1 to the common multiples you have identified. This would give us the numbers 37 and 73. An answer choice option of 37 is not among the options given, but 73 is. **Answer choice C is correct.**

Use **Figure 5** below to answer question 30.

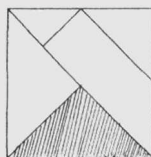


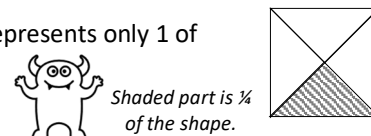
Figure 5

QUESTION 30 ANSWER EXPLANATION

30. What fraction of the whole shape in **Figure 5** is shaded?

- (A) $\frac{1}{16}$ (B) $\frac{1}{8}$
(C) $\frac{1}{4}$ (D) $\frac{1}{2}$

The shape above can be divided into exactly four parts as shown to the right. The shaded part represents only 1 of these 4 parts, and as a fraction, 1 of 4 if written as $\frac{1}{4}$. **Answer choice C is correct.**



QUESTION 31 ANSWER EXPLANATION

31. The volume of a box = area of base x height.

If the volume of a box is 400 cm^3 and the area of the base is 40 cm^2 , what is the height in cm of the box?

- (A) 10 (B) 40
(C) 400 (D) 16 000

Start with the formula given: volume of a box = (area of base) x (height). We are given that the volume = 400 cm^3 and the area of the base = 40 cm^2 , so we have the following equation we need to solve: $400 \text{ cm}^3 = (40 \text{ cm}^2)(\text{height})$

1. Divide both sides of the equation by 40 cm^2 .	$\frac{400 \text{ cm}^3}{40 \text{ cm}^2} = \frac{(40 \text{ cm}^2)(\text{height})}{40 \text{ cm}^2}$
2. Cancel out the 40 cm^2 in the numerator and denominator on the right hand side of the equation.	$\frac{400 \text{ cm}^3}{40 \text{ cm}^2} = \frac{\cancel{40 \text{ cm}^2}(\text{height})}{\cancel{40 \text{ cm}^2}}$ now equals $\frac{400 \text{ cm}^3}{40 \text{ cm}^2} = \frac{(\text{height})}{1}$
3. Solve for height by dividing 400 by 40.	$\frac{400 \text{ cm}^3}{40 \text{ cm}^2} = \frac{(\text{height})}{1}$ is now $400 \text{ cm}^3 \div 40 \text{ cm}^2$ which equals 10 cm.

Answer choice A is correct.



QUESTION 32 ANSWER EXPLANATION

32. If 900 is increased by 30%, then the new number would be
- (A) 270 (B) 630
(C) 1170 (D) 90 030

The problem is telling us 900 has increased. Right away, this eliminates answer choices **A** and **B** because both of their values are lower than the initial 900.

If we're going to set up a math equation to solve this, we want to first calculate the amount of the percentage, then add that to the original value as follows:

$$\left(900 \times \frac{30}{100}\right) + 900 = \text{answer}$$

We can rewrite this to help make it easier to simplify.

$$\frac{(900)(30)}{100} + 900 = \text{answer can now have the 100 crossed out to say } \frac{(900)(30)}{100} + 900 = \text{answer}$$

The equation is now simplified into:

$$\frac{(9)(30)}{1} + 900 = \text{answer which is the same as saying } 270 + 900$$

Answer choice C is correct.

Use the diagram below to answer question 33.

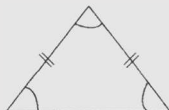


Figure 6

QUESTION 33 ANSWER EXPLANATION

33. In the isosceles triangle above, the base angles are 72° each. What is the size of the third angle?
- (A) 36° (B) 72°
(C) 144° (D) 180°

All triangles have three interior angles that add up to 180° . An isosceles triangle is defined as a triangle having two sides of identical length, and the two interior angles opposite these sides are of identical measurement in degrees. The problem tells us that two of the angles are 72° each, so we can get our answer for the measurement of the third angle by doing the following calculation:

$$72^\circ + 72^\circ + x = 180^\circ$$

$$144^\circ + x = 180^\circ$$

$$x = 180^\circ - 144^\circ$$

$$x = 36^\circ$$

Answer choice A is correct.



Use **Figure 7** below to answer question 34.

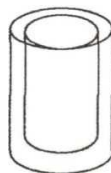


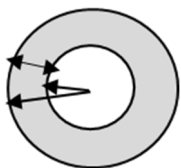
Figure 7

QUESTION 34 ANSWER EXPLANATION

34. The diagram in **Figure 7** represents a piece of pipe. The radius of the outer circle of the pipe is 10.5 cm and the radius of the inner circle is 5.4 cm. What is the thickness of the pipe?

- (A) 4.1 cm
- (B) 5.1 cm
- (C) 15.4 cm
- (D) 15.9 cm

If you were to look at the pipe from the top, it would look like this:



The double-headed arrow represents the thickness of the pipe.

The shorter single-headed arrow is the inner radius, and longer single-headed arrow is the outer radius.

The thickness is the difference between the outer radius and the inner radius. In this case, this can be written as follows:

$$10.5 \text{ cm} - 5.4 \text{ cm} = \mathbf{5.1 \text{ cm}}$$

Answer choice B is correct.

Use the Venn diagram in **Figure 8** to answer questions 35 and 36.

In the Venn diagram below:

- Set **A** has 15 girls with long hair
- Set **B** has 18 girls with blue ribbon
- 6 girls have neither long hair nor blue ribbon

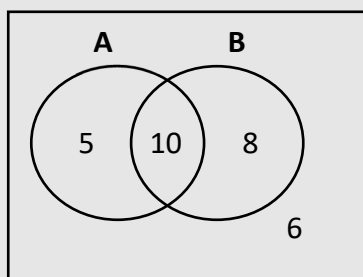


Figure 8

QUESTION 35 ANSWER EXPLANATION

35. Set **A** intersect set **B** can be described as all girls with

- (A) neither long hair nor blue ribbons
- (B) long hair and blue ribbons
- (C) with ribbons
- (D) long hair

Set **A** has girls with long hair while set **B** has girls with blue ribbon. An intersection of two sets means that the members of this set have the qualities of both sets. In this case, the members of set **A** intersect **B** would have to be all girls with long hair and blue ribbons. **Answer choice B is correct.**



QUESTION 36 ANSWER EXPLANATION

36. How many girls have neither long hair nor blue ribbon?
- (A) 10 (B) 8
(C) 6 (D) 5

Set **A** has girls with long hair while set **B** has girls with blue ribbon. This question is asking you how many girls are not part of either set **A** or set **B**. This number would be located outside the two circles as can be seen with the number 6 in the Venn diagram above. **Answer choice C is correct.**

QUESTION 37 ANSWER EXPLANATION

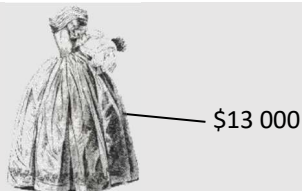
37. Lisa shared 120 stickers with her two sisters in the ratio 4:3:1. How many stickers make up the largest share?
- (A) 128 (B) 60
(C) 45 (D) 15

The ratio 4:3:1 means there is a total of 8 parts. Whoever is getting the largest share is getting 4 of those 8 parts. The ratio of 4 out of 8 can be set up as the fraction $\frac{4}{8}$, and that fraction can now be used to get the answer by multiplying it with the 120 stickers.

$$\frac{4}{8} \times 120 \text{ is the same as } \frac{1}{2} \times 120$$

$$\frac{1}{2} \times 120 = \frac{120}{2} = \mathbf{60}$$

Answer choice B is correct. Whoever is getting the largest share is getting half the stickers.



QUESTION 38 ANSWER EXPLANATION

38. The marked price for the dress above was \$13 000. If 16% VAT is calculated on the marked price, what amount was paid for the dress?
- (A) \$208 (B) \$2080
(C) \$11 920 (D) \$15 080

The problem is very similar to problem 32. The answer must be a number larger than the original \$13 000, so right away answer choices **A** and **B** are eliminated.

If we're going to set up a math equation to solve this, we want to first calculate the amount of the percentage, then add that to the original value as follows:

$$(13\ 000 \times \frac{16}{100}) + 13\ 000 = \text{answer}$$

We can rewrite this to help make it easier to simplify.

$$\frac{(13\ 000)(16)}{100} + 13\ 000 = \text{answer can now have the 100 crossed out to say } \frac{(13\ 000)(16)}{100} + 13\ 000 = \text{answer}$$



The equation is now simplified into:

$$\frac{(130)(16)}{1} + 13\,000 = \text{answer}$$

Multiplying $130 \times 16 = 2080$. We now add \$2080 to the original \$13 000 and get \$15 080. **Answer choice D is correct.**

Use the graph below to answer questions 39 and 40.



QUESTION 39 ANSWER EXPLANATION

39. Amelia picks and then sells vegetables from her garden at a roadside stand. How many cabbages were sold?

- (A) 6 (B) 8
(C) 10 (D) 12

This bar graph is telling us how many of each vegetable was sold. The bar labelled cabbage indicates 12 cabbages were sold. **Answer choice D is correct.**

QUESTION 40 ANSWER EXPLANATION

40. How many more pumpkins than squash did Amelia sell?

- (A) 9 (B) 10
(C) 11 (D) 12

From the bar graph, we see 18 pumpkins were sold and 7 squash were sold. Doing some subtraction, we get $18 - 7 = 11$.

11 more pumpkins were sold than squash. **Answer choice C is correct.**

