Caribbean
Education
Project

Preparation for the National Grade Six Assessment
Guide #3 | Mathematics Free Response

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 6 past exam questions. Try to answer these questions in the prescribed 55 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 55 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 skills 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 2

2010

Reading Time: 10 minutes
Writing Time: 45 minutes

Read these instructions carefully before you attempt to answer the questions.

1. **Write your candidate number clearly on each page.**

2. This paper contains **six** questions. You are required to answer **QUESTION ONE** and **THREE** others. **EACH** question is worth **5** marks.

   Note: You must answer ONLY FOUR questions.

   Be sure to answer **FULLY** the **FOUR** questions.

3. Write the answer for each question in the space provided in this booklet.

4. Drawings and handwriting **must** be clear at **all times**.

5. Each step of your work **must** be **clearly** shown in this booklet.

6. If you have to erase, do so cleanly.

7. Look over your work when you have finished.

8. **Do not** take away any part of this booklet.

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

_____

Question one is compulsory

1.   (a) $4\dfrac{1}{5} + \dfrac{1}{3} - 1\dfrac{2}{6}$ (2 marks)

      (b) $(7.2 + 5) \times 0.6$ (3 marks)

Total (5 marks)

CANDIDATE NUMBER: _____

2.   (a)   After travelling 60 km, a motorist still had 50% of the journey to travel. What was the total length of the journey?   (2 marks)

     (b)   If the motorist took 3 hours for the whole journey, calculate his average speed.   (3 marks)

Total (5 marks)

CANDIDATE NUMBER: _____

Use the Table below to answer question 3.

Children	Mass in kg
Sunita	50
Sean	38
Ruel	26
Jermey	40
Nancy	35

3.   (a)   What is the difference in mass, between Sunita and Nancy?   (1 mark)

(b)   Between which **two** children is there the smallest difference in mass?   (1 mark)

(c)   Which **two** children will give a total of 85 kg?   (1 mark)

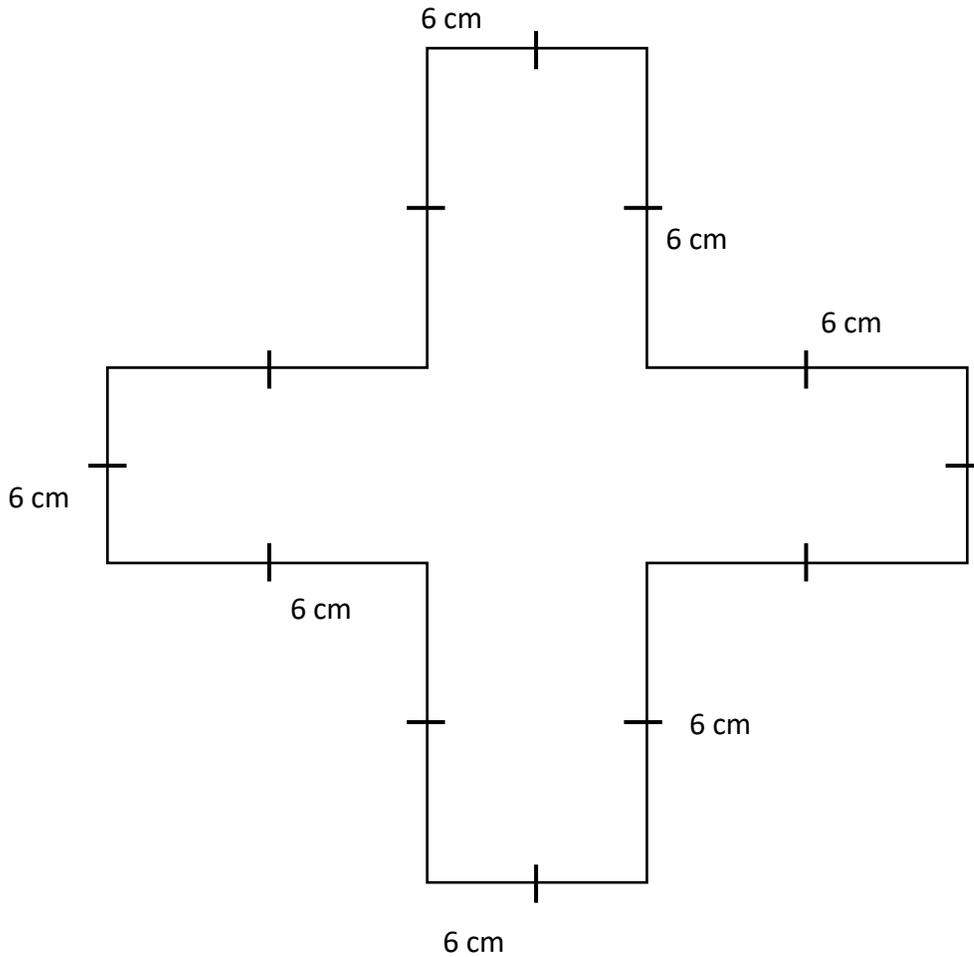(d)   (i)   Between which two children is there the greatest difference in mass?

(ii)   What is the difference in their mass?   (2 marks)

Total (5 marks)

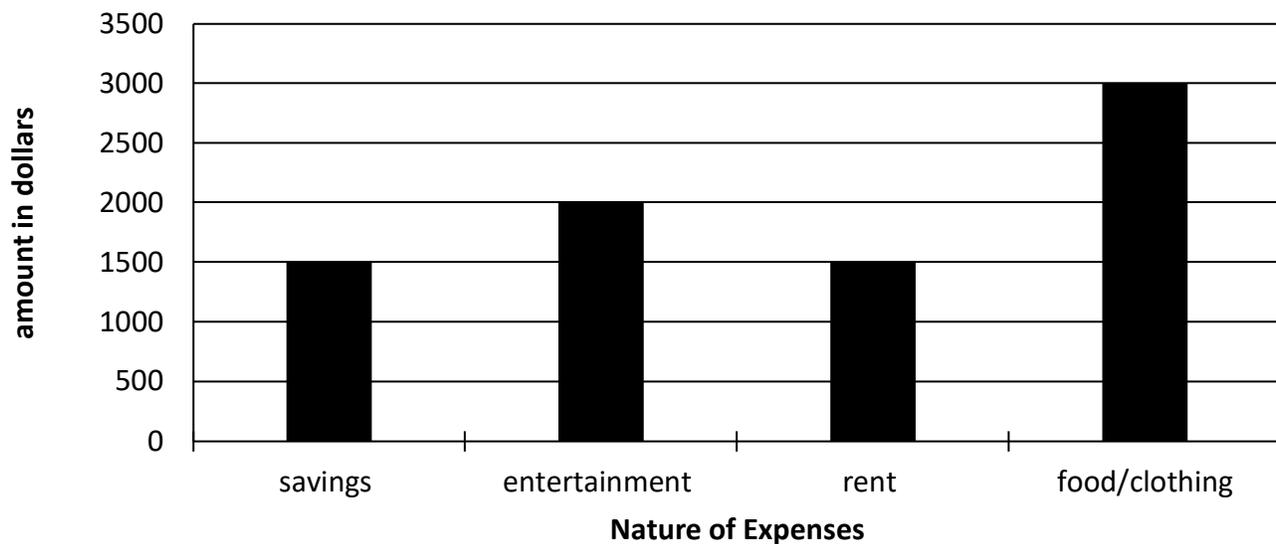4. Find the area of the shape below.

6 cm

6 cm

6 cm

6 cm

6 cm

6 cm

6 cm

6 cm

Total (5 marks)

The graph below shows how Pat spends her weekly wages. Use it to answer question 5.

5.   (a)   How much does Pat save?   (1 mark)

(b)   How much does she spend on food/clothing and entertainment altogether?   (1 mark)

(c)   What is Pat's weekly wage?   (1 mark)

(d)   How much would Pat earn in two weeks?   (2 marks)

Total (5 marks)

CANDIDATE NUMBER: _____

The Venn diagram below shows the number of pupils in Grade 6 B who like chicken and fish. Study the information then answer question 6.

U

Chicken   Fish

10   12   13

4
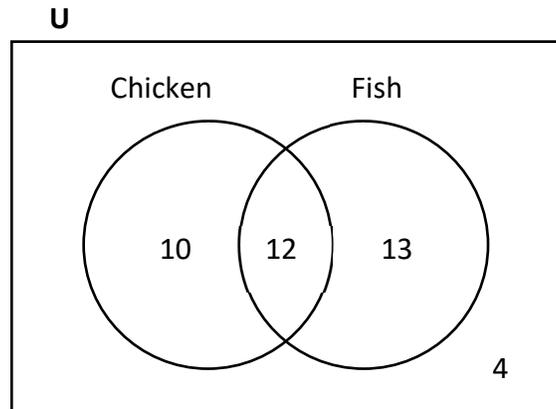
6.   (a)   How many pupils like chicken **only**?   (1 mark)

        (b)   How many pupils like **both** chicken and fish?   (1 mark)

        (c)   How many pupils like **neither** chicken **nor** fish?   (1 mark)

        (d)   How many children are in Grade 6 B?   (2 marks)

Total (5 marks)

END OF TEST

ANSWER EXPLANATIONS

QUESTION 1.(a) ANSWER EXPLANATION

Question 1

1. (a) $4\frac{1}{5} + \frac{1}{3} - 1\frac{2}{6}$ (2 marks)

This problem requires us to understand **mixed numbers**.

In the problem, we can separate the whole number and fractions into two different equations, solve each equation, then add together these individual outcomes to get the final answer.

The whole number equation would be $4 + 0 - 1 = ?$; the 4 comes from the whole number in the first mixed number, the 0 comes from the second mixed number, and finally the −1 comes from the last mixed number. The reason we have a 0 as the whole number in $\frac{1}{3}$ is because there is not a given whole number so we can place 0 as a place holder. We use −1 instead of 1 for the last mixed number because there is a subtraction sign in front of the problem stating that it is being subtracted from the sum of 4+0.

$$4 + 0 - 1 = 3$$

Now we can look at the fraction equation for the problem. The equation is:

$$\frac{1}{5} + \frac{1}{3} - \frac{2}{6} = ?$$

Now that we have the equation written out, the next step would be to solve the equation. This equation has multiple different denominators, so we must find a common denominator with factors of 5, 3, and 6.

This common denominator can be 30 since 5x6=30 and 3x10=30. We know that 30 is a good common denominator by looking at the multiples of each number and finding a common multiple.

Multiples of 5: 5, 10, 15, 20, 25, **30**, etc…
Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, **30**, etc…
Multiples of 6: 6, 12, 18, 24, **30**, etc…

Now that we have figured out the common denominator for the equation, we need to multiply each fraction by the correct number needed to make it equal that common denominator. **Remember: when we want to change the denominator of a fraction to make it easier for us to add and subtract fractions, we must multiply (or divide) both the numerator and the denominator by the same whole number**. By doing this, we are multiplying (or dividing) by 1. To illustrate this more clearly, see the three conversions below.

For $\frac{1}{5}$ $\frac{1}{5} \times \frac{6}{6} = \frac{\mathbf{6}}{\mathbf{30}}$	For $\frac{1}{3}$ $\frac{1}{3} \times \frac{10}{10} = \frac{\mathbf{10}}{\mathbf{30}}$	For $\frac{2}{6}$ $\frac{2}{6} \times \frac{5}{5} = \frac{\mathbf{10}}{\mathbf{30}}$

Now we have the equation: $\frac{6}{30} + \frac{10}{30} - \frac{10}{30} = ?$; since each fraction now has the same denominator, we can do the math with the numerators. When we solve the problem, we get $\frac{6}{30}$ as the answer.

$\frac{6}{30}$ can be further simplified because both 6 and 30 share a common factor of 6. Dividing by $\frac{6}{6}$ is the same as dividing by 1.

$$\frac{6}{30} \div \frac{6}{6} = \frac{1}{5}$$

Now add together the answer we got from the whole numbers to the answer we got from the fractions. We get $3 + \frac{1}{5} = 3\frac{1}{5}$.

Answer: $3\frac{1}{5}$.

QUESTION 1.(b) ANSWER EXPLANATION

<u>Question 1</u>

1.   (b) $(7.2 + 5) \times 0.6$ (3 marks)

In addition to testing on addition and multiplication, this problem tests us on following the order of operations. An easy way to remember the order of operations is to memorize the order PEMDAS. You can come up with an acronym.

Parenthesis	**P**lease
Exponents	**E**xcuse
Multiplication	**M**y
Division	**D**ear
Addition	**A**unt
Subtraction	**S**ally

Since there is a parenthesis, we solve that part of the equation first.

$$(7.2 + 5) = 12.2$$

Now we can complete the problem by rewriting the equation as 12.2 x 0.6, which is now a multiplication problem. When multiplying decimals, you multiply as usual, then put the decimal into the final product at the end. The position of the final decimal point in the product needs to be the same number of places to the left as the **total** number of places the decimals are to the left in **both** factors combined. For the factors presented, 12.6 has the decimal one position to the left and 0.6 also has the decimal one position to the left. This means when we sum up the decimal positions to the left for **both** 12.6 and 0.6, we have $1 + 1 = 2$, so our final answer will require us to insert the final decimal two places to the left of the final figure.

Here is a version of doing the multiplication where we ignore the decimal until the very end. We can insert it after getting the value.

Not finished yet!
Need to insert the
decimal point.

```
              12.6
        x      0.6
        _____
               36     (product of multiplying the first column on the right as 6x6)
              120     (product of multiplying the second column from right as 6x2 and then adding a zero to the end)
        +     600     (product of multiplying the third column from the right as 6x1 and then adding two zeros to the end)
        _____
              756     total BEFORE inserting decimal point
```

At this point, we have the value 756, but we said earlier that we need to insert the decimal point **two positions** from the right because the initial factors had a total of decimal positions that added up to two.

Answer: 7.56

QUESTION 2.(a) ANSWER EXPLANATION

2.   (a)   After travelling 60 km, a motorist still had 50% of the journey to travel. What was the total length of the journey?   (2 marks)

In this problem, there are a couple of things that we know. The motorist drove 60 km and still has 50% of the journey left. This means the motorist has already completed 50% of the journey by traveling 60km. We know that 50% + 50% = 100%. If it took 60 km to complete the first 50% of the trip, then it will take another 60 km to reach 100%. With this understanding, we can set up the equation as $60\ km + 60\ km = ?$ and solve this to be 120 km.

Answer: 120km

QUESTION 2.(b) ANSWER EXPLANATION

<u>Question 2</u>

2.   (b)   If the motorist took 3 hours for the whole journey, calculate his average speed.   (3 marks)

In this problem, we are trying to find the average speed of the motorist. We know that the trip was 120 km long and it took the motorist 3 hours to travel that distance. Speed is measured in km/hour (kilometres per hour).

To find the average speed of the motorist, we can plug in the numbers according to the fraction to get $\frac{120\ km}{3\ hours}$. Now we simply divide the numbers to get the average speed.

Answer: 40 km/hour

Question 3 ANSWER EXPLANATION
Use the table below to answer question 3.

Children	Mass in kg
Sunita	50
Sean	38
Ruel	26
Jermey	40
Nancy	35

QUESTION 3.(a) ANSWER EXPLANATION

<u>Question 3</u>

3   (a)   What is the difference in mass, between Sunita and Nancy?   (1 mark)

This problem requires the use of subtraction. We know that difference is a key word used for subtraction. So, the problem can be written into a math equation like so: Sunita's mass – Nancy's mass = the difference. This will give us:

$$50\ kg\ -\ 35\ kg\ = ?$$

The only thing left to do is solve using subtraction. The answer is 15 kg.

Answer: 15 kg

QUESTION 3.(b) ANSWER EXPLANATION

<u>Question 3</u>

(3)   (b)   Between which **two** children is there the smallest difference in mass?   (1 mark)

This problem is a subtraction problem. The problem wants us to find the smallest difference in mass when subtracting the mass of one child from another. The easiest way to tackle this problem is to look for two numbers that are close to each other because when we subtract them, it will give us a small difference. If we map the numbers on a number line, we can get a better, visual understanding of which number combination will give us the smallest difference. Jermey and Sean's masses are the closest to each other since their masses are 40 kg and 38 kg respectively. When you find the difference of 38 and 40, you get $40\ kg\ -\ 38\ kg = 2\ kg$. But be careful: the question asks for the names of the children, not for us to say the answer is 2 kg!

The values are the kg masses of each child. We can see that 38 and 40 appear to be the closest to each other.
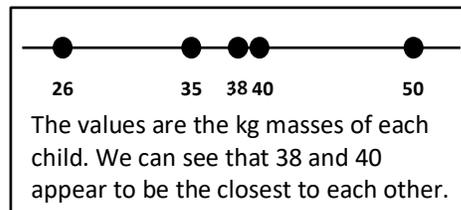
Answer: Jermey and Sean

QUESTION 3.(c) ANSWER EXPLANATION

<u>Question 3</u>

| 3 | (c) | Which **two** children will give a total of 85 kg? | (1 mark) |

Because we want two weights that add up to 85, we need to choose two values that when summed, will give a final digit of 5.

In looking at the chart of weights, the only options where the final two digits add to 5 would be adding 50+35 or adding 40+35. Any other combination of two weights will not give an answer that ends in 5.

$$50 + 35 = \mathbf{85} \ \ while \ \ 40 + 35 = 75$$

Again, be careful that you answer the question being asked! We need to give the **names of the children** who weigh 50 kg and 35 kg.
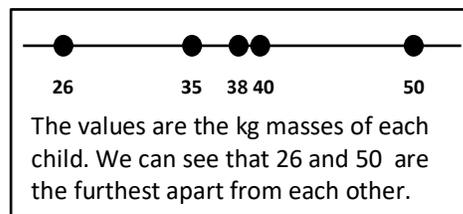
Answer: Sunita and Nancy

QUESTION 3.(d)(i) ANSWER EXPLANATION

<u>Question 3</u>

| 3 | (d) | (i) | Between which two children is there the greatest difference in mass? | (1 mark) |

In this problem, we are trying to find the greatest difference in mass which means we will subtract the lowest mass from the highest. Using the same visual number line we created for 3(b) (or just looking at the original chart), we see 50 kg is the highest mass while 26 kg is the lowest. Again, answering the question that asks for the names (not for the actual math calculation), we see the masses belong to Sunita and Ruel.

The values are the kg masses of each child. We can see that 26 and 50 are the furthest apart from each other.

Answer: Sunita and Ruel

QUESTION 3.(d)(ii) ANSWER EXPLANATION

<u>Question 3</u>

| 3 | (d) | (ii) | What is the difference in their mass? | (1 mark) |

Now, we do the actual math calculation discussed in 3(d)(i).

$$50 \, \text{kg} - 26 \, \text{kg} = \mathbf{24 \, kg}$$

Answer: 24 kg

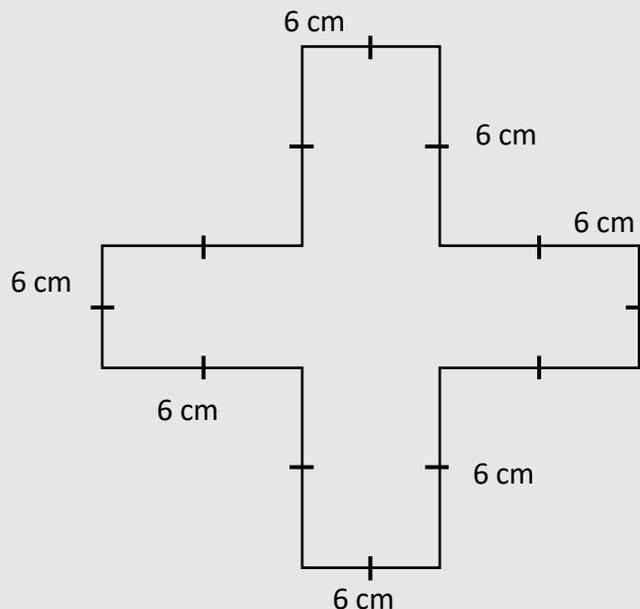**QUESTION 4.(a) ANSWER EXPLANATION**

Question 4
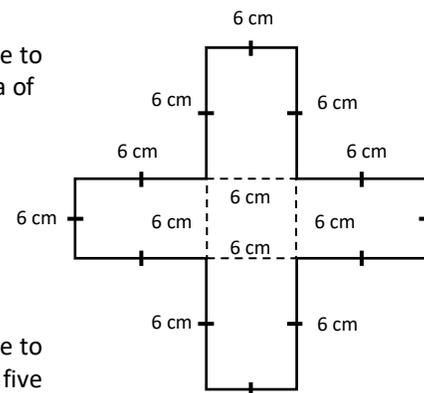
4.   Find the area of the shape below.   (5 marks)

The small lines on the shape are telling us that each side is parallel to the side that is opposite to it, and we are told every side measures 6 cm. We do not have a formula that tells us the area of a shape that looks like a plus sign, but we could divide this shape into 5 individual parallelograms. A parallelogram is a four-sided plane rectilinear figure with opposite sides parallel. The illustration on the right shows a dotted line turning the shape into 5 parallelograms.

The value to this is we should know that the area of a parallelogram is (length) x (width).

The small lines on the shape are telling us that each side is parallel to the side that is opposite to it, and we are told every side measures 6 cm. With this knowledge, we can see that we have five squares all touching each other. Each square is made up of sides that are 6 cm long.

With this understanding, we can solve the areas of each of the five squares and then add them all up at the end. Since the area for each square is the same (6 cm)(6 cm) = 36 cm², we now have a final calculation that looks like this:

$$5 \times 36 \ cm^2 = 180 cm^2$$

Answer: 180 cm²

*NOTE: Do NOT use the logic that some of the parallelograms do not look exactly like squares! For sure, four of those shapes above look like rectangles. Understand that it is common for the pictures in test questions to not be accurately drawn to scale. **ALWAYS use the values that are given.***

QUESTION 5.(a) ANSWER EXPLANATION

<u>Question 5</u>

The graph below shows how Pat spends her weekly wages. Use it to answer question 5.
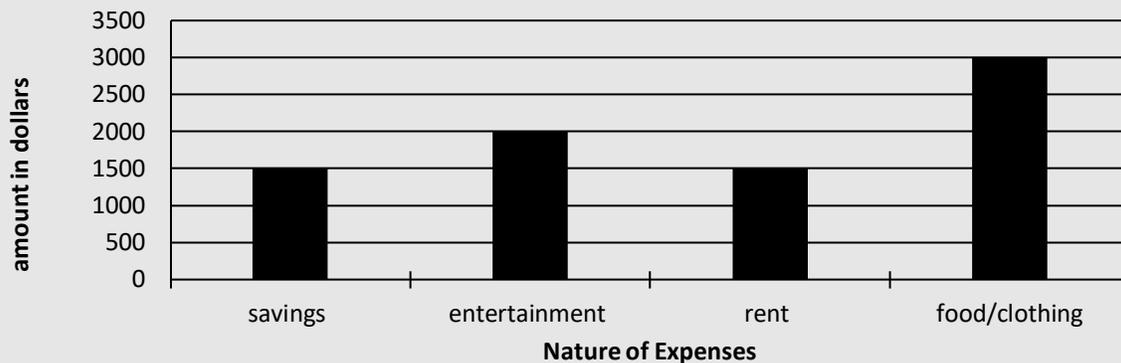
5.   (a)   How much does Pat save?   (1 mark)

The question is asking about the amount of money that Pat saves. The graph on the x-axis (the horizontal axis) shows the different areas in which Pat uses her weekly wages. One of the categories that Pat puts her money into is called "savings". We know that savings means the amount of money that Pat is not using but instead saving. This category will tell us the answer to the question. If we look at the savings bar, we see it is shaded until 1500 dollars. This means that Pat saves 1500 dollars from her weekly wage.

Answer: 1500 dollars

QUESTION 5.(b) ANSWER EXPLANATION

<u>Question 5</u>

5.   (b)   How much does she spend on food/clothing and entertainment altogether?   (1 mark)

This question is asking about the amount of money that Pat spends in two of the four categories. The question wants to know the sum of the money spent on food/clothing and entertainment. If we look at the bar graph, we can see that she spends 3000 dollars on food/clothing since the bar is filled until the 3000 mark, and she spends 2000 dollars on entertainment since the bar is filled until the 2000 mark. Now we have to find the sum of 3000 dollars + 2000 dollars since it is asking for how much money she spends altogether.

Answer: 5000 dollars

QUESTION 5.(c) ANSWER EXPLANATION

<u>Question 5</u>

5.   (c)   What is Pat's weekly wage?   (1 mark)

This question is asking for the amount of money that Pat makes in one week. If we read the sentence above the graph, we see it says, "The graph below shows how Pat spends her weekly wages." This means the bars in the graph show the total weekly wage that Pat earns since the graph is illustrating how she spends that weekly wage. In order to find the answer, we have to add the amount of money that Pat spends in the four different area together like this: 1500 (savings) + 2000 (entertainment) + 1500 (rent) + 3000 (food/clothing) = 8000.

Answer: 8000 dollars

QUESTION 5.(d) ANSWER EXPLANATION

<u>Question 5</u>

| 5. | (d) | How much would Pat earn in two weeks? | (2 marks) |

In the previous question, we figured out that Pat earns 8000 dollars every week. To figure out how much she makes in two weeks, either add her weekly income twice:

$$8000 + 8000 = 16\,000$$

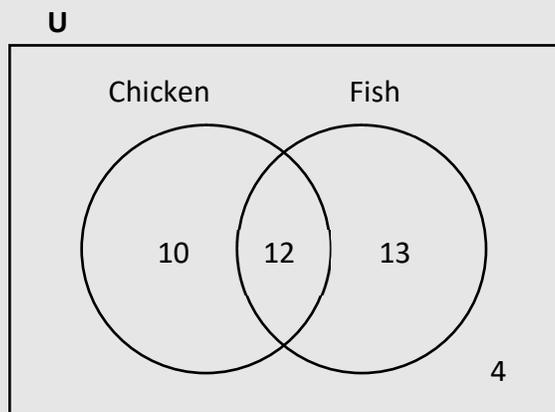or, double her weekly earning. That would be shown as:

$$2 \times 8000 = 16\,000$$

Answer: 16 000 dollars

QUESTION 6.(a) ANSWER EXPLANATION

<u>Question 6</u>

The Venn diagram below shows the number of pupils in Grade 6 B who like chicken and fish. Study the information then answer question 6.

| 6. | (a) | How many pupils like chicken **only**? | (1 mark) |

This question is asking for the number of pupils that **only** like chicken. When looking at a Venn diagram, remember that there are two circles that represent two different categories. In this case, we have a circle on the left side for pupils that like chicken and a circle on the right side for pupils that like fish. The overlapping part of the two circles represents the pupils that like both chicken and fish. The area outside the circles but inside the rectangle represents the number of pupils that like neither chicken nor fish.

For this problem, we need to find the number of pupils that like only chicken. This means that we have to look for the circle that represents chickens which is the left-hand circle. There are two numbers in this circle, 10 and 12. The number 10 represents the pupils that **only** like chicken and the number 12 represents the pupils that like **both** chicken and fish.

Answer: 10 pupils

QUESTION 6.(b) ANSWER EXPLANATION

<u>Question 6</u>

> 6.   (b)   How many pupils like **both** chicken and fish?   (1 mark)

As discussed in the explanation above in 6.(a), the answer is 12.

Answer: 12 pupils

QUESTION 6.(c) ANSWER EXPLANATION

<u>Question 6</u>

> 6.   (c)   How many pupils like **neither** chicken **nor** fish?   (1 mark)

As discussed in the explanation above in 6.(a), the area outside the circles but inside the rectangle represents the number of pupils that like neither chicken nor fish.

Answer: 4 pupils

QUESTION 6.(d) ANSWER EXPLANATION

<u>Question 6</u>

> 6.   (d)   How many children are in Grade 6 B?   (2 marks)

This question is asking for the total number of children in grade 6 B. In addition to the Venn diagram illustrating the number of children who like chicken only, who like fish only, who like both chicken and fish, and who like neither chicken nor fish, the diagram tells us how many total children are in Grade 6 B when we add up all the numbers inside the rectangle.

$$10 + 12 + 13 + 4 \ = \ 39$$

Answer: 39