YEAR 7
MATHEMATICS

LESSON 6: RATIOS 2
Notice to Students

- Attempt ALL questions.
- **INCOMPLETE HOMEWORK** will NOT be marked. If you are having difficulty with your homework, please seek assistance through **ADDITIONAL SUPPORT** (WORKSHOP) on Sundays.
- The grading for your homework will be recorded for reporting purposes.
- Allocated time for this homework book is 1 hour.

**Student Evaluation**

This evaluation identifies your strengths and weaknesses in this topic.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>Highly Competent</th>
<th>Competent</th>
<th>Developing</th>
<th>Experiencing Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognises number patterns and expresses these in algebraic form and translates between words and algebraic symbols.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognises like terms and simplifies expressions using the four operations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Marker’s Comments:**

- You are a Maths genius! Keep up the great work.
- Check online solutions for explanations for your mistakes.
- Attend Maths Workshops to address your learning need.
Question 1

Use the most appropriate method to solve the following problems.

(a) The ratio of red pens to blue pens is 3 : 8. If there are 24 red pens how many blue pens are there?

(b) For every 6 bluebell plants in a garden there are 5 snowdrops. If there are 70 snowdrops in total, how many bluebells are in the garden?

(c) The ratio of cows to pigs is 4 : 5 and the ratio of pigs to sheep is 1 : 11.

   (i) What is the ratio of cows to sheep?

   (ii) If there are 36 cows how many pigs and sheep are there?
(d) The sides of a triangle are in the ratio $3 : 5 : 7$. The shortest side measured 4.8 cm. Calculate the perimeter of the triangle.

(e) The ratio of Eunice’s age to Matt’s age is $7 : 6$. Matt is 24 years old. What is the sum of their ages?

(f) The ratio of the size of a model train to the actual train is $1 : 20$. The actual train is 17.4 metres long. Calculate the length of the model train.
(g) In a farm, the ratio of cows to horses is $14 : 9$. The farm had 112 cows. Calculate the number of horses in the farm.

(h) The ratio of fortnightly savings to expenditure in the Kazzi household is $2 : 15$. The Kazzi family saves $240 each fortnight, calculate the fortnightly expenditure of the household.

(i) A certain weedkiller concentrate is mixed with water in the ratio 1 part weedkiller to 20 parts of water.

(iii) How much weedkiller concentrate should be mixed with 3 litres of water?

(iv) How much of each ingredient is present in a watering can that holds 3 litres? Answers correct to the nearest mL.
(j) Olivia is 1.5 metres tall. At a certain time of the day, Olivia casts a shadow of length 2 metres. At the same time of day, what is the length of the shadow of a tree of height 9 metres?
Question 2

(a) Increase 35 km in the ratio 7 : 10

(b) Decrease 250 mL in the ratio 3 : 1

(c) Allison has a recipe for spaghetti bolognaise that needs 750 grams of minced meat. She wishes to increase all the amounts in the recipe by a ratio of 2 : 3. How much minced meat should she use?

(d) A computer programme compresses files (reduces the size they occupy on a disk) in the ratio 5 : 3. The compressed files occupied 180 kilobytes (kb) of space on a disk, what was the size of the original file in kb?
(e) A photograph is enlarged in the ratio 3 : 7. The enlarged photograph was 35 cm long, what was the length of the original photograph?

(f) The drying time for paint decreases in the ratio 3 : 2 when the surrounding temperature increases from 20°C to 30°C. The drying time is 6 hours when the temperature is 20°C. Find the drying time of the paint when the temperature is 30°C.

Question 3

(a) Model cars are built to the scale 1:20.

(i) Find the actual length of a car when its model has a length of 22 cm.

(ii) The actual length of the car is 3.4 metres. What is the length of its model car? Give your answer correct to the nearest mm.
(b) On a map the scale shown below was given.

- ![Map Scale Image]

(i) Explain what this scale means on the map.

(ii) When this scale is expressed in the form \(1:x\), what is the value of \(x\)?

(iii) The distance between two towns is 680 km as the crow flies. How long is the line joining the two towns on the map?

(iv) The distance between two towns on the map is 8.6 cm. What is the actual distance between the two towns?
(c) A microscope has a magnification of $100 \times$. What is the actual size of an object that appears through the microscope with a length of 300 mm?

(d) The scale of street directory is shown below.

```
  0 1 2 3 4 5 6 7
```

Express this scale in the form $1 : y$

(e) The scale on a house plan is $1 : 400$

(i) Explain what this means.

(ii) The garage on the plan measures 15 mm by 10 mm. What is the actual dimensions of the garage? Give your answer in metres.