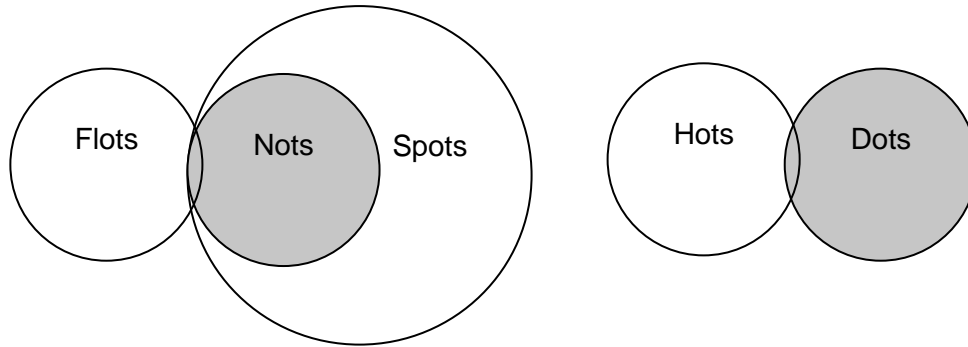


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The key problem is that we don't know which of the nots that are all spots are also flots. Looking at the Venn diagrams, we can go through the possible answers to see if any are true.

Answer	True?
(a) All dots are nots	This cannot be true, as no link has been mentioned between dots and nots
(b) Some nots may also be flots	This could make sense, because we can see from the diagrams that while all nots are spots, some flots are nots and therefore some nots are flots.
(c) All hots are dots	We know that some DOTS are HOTS, but there is nothing to indicate that all HOTS are DOTS
(d) All nots are flots	While we know that some FLOTS are NOTS, the diagram shows us that some NOTS may be SPOTS without being FLOTS, so this option does not make sense.
(e) Some flots are dots	This does not make sense, as no connection has been mentioned between FLOTS and DOTS.

The correct answer, then, is (b). Be careful that you don't make assumptions too early on, or fill in bits of missing information. If you're told that "all x is y ", "some y is t " and "some t is p " – remember that there are some unknowns here, which you need to incorporate into your Venn diagrams. This is because we don't know whether the t that is p is also y , because only some y is t .

3.3 Worded Questions Using Fractions

Worded questions involving fractions will test your ability to calculate answers using fractional values. You will know that you are dealing a problem involving fractions if there are fractional values such as $\frac{1}{2}$, words such as a quarter, half, one-fifth, three-quarters or any other worded equivalent of a fraction.

Worded questions using fractions also encompass percentages and/or decimals. Therefore you need to be confident with fractions, percentages, decimals and equivalent fractions going across all three types. For example, you should know that $\frac{1}{2}$ is equal to 50% which is also equal to 0.50. You should already know how to add, subtract, multiply and divide with fractions. If you do not know the above, it is highly recommended that you refer to a mathematics text book that will go through these concepts in preparation for the exam.

The way you would approach a question like this is similar to any normal worded numerical question - read the question and use the values given to find the answer. A suggested approach is shown below.

Steps	Suggested Approach
Step One	Identify the clues or hidden information first. This means you should read the question carefully. Are you subtracting a fraction or will you have to add? Is someone receiving or are they giving? Is someone receiving a residual amount? If you are given a fraction, do you know what the whole is?
Step Two	Convert where necessary. It is easier to deal with like fractions e.g. if you get a question that combines decimals with fractions, change it so that you are dealing with the same type. That is, change the decimal to a fraction so you are dealing with only fractions or change the fraction to a decimal so you are only dealing with decimals.

3.4 Worded Questions Using Algebra

Questions involving algebra are the most common type of question in a numerical reasoning test. Algebra questions involve using a whole variety of skills such as basic arithmetic, decimals, fractions and percentages. Don't be discouraged if you haven't learned algebra in school yet – algebra is really just trying to find the unknown amount. A simple example of algebra in action is as follows.

A fruit box contains 10 fruit pieces. There are oranges, apples and pears. We know that there are four apples. The number of oranges is half that of apples. How many are pears?

This is algebra because you are required to find the unknown – that is, how many pears? We know that there are four apples and two oranges (half of four apples equals two). Given that the fruit box contains ten fruits, when we deduct the four apples and the two oranges we are left with four pieces of fruit which are the pears.

Algebra questions test your ability to visualise a question in terms of different items and to find the connection between them.

So how do you know if you are dealing with a question that involves algebra?

Unlike straight numerical questions, where you would perhaps be asked to find an item, numerical reasoning questions involving algebra can be quite difficult to identify. Instead of representing the unknown as an item, it may simply ask you to find a missing piece of information in words. Following this logic, you may consider all numerical reasoning questions to be algebraic because they are always asking you for some unknown number. However, in a worded question it is up to you to consider the clues and assign items to different information. Basically, use what is available to help you solve a question algebraically.

Now... let's look at a sample practice question.

Tania earns an hourly wage for her job. However, she will also receive a 10% bonus at the end of the day if she performs well. If she has made \$200 today from a 6-hour shift including the bonus, what is her hourly wage?

3.6 'As many as' or 'x more than y' Questions

This type of question is similar to algebra questions in that you are often required to form algebraic equations in order to find the answer. You will know you are dealing with this type of question in the exam if the question is structured similar to the below.

How many black socks are there in a drawer with 88 socks if there are $\frac{1}{3}$ as many white socks as black socks? Assume that there are only black and white socks in a drawer.

This type of question requires the student to use a whole variety of skills such as basic arithmetic, decimals, fractions and percentages. Many of these questions ask you to identify a mathematical relationship from what is given to you and to use that relationship to find the unknown number.

So...how do you solve this type of question in the exam? It is easiest to use visual analysis – that is, draw out the question and find the answer from that. Below is a step-by-step guide to completing visual analysis.

Steps	Proposed Action
Step One	Read the question carefully. Key words such as 'twice as much' and 'if... will be equal to' reveal important clues that will help you form pictures in your head.
Step Two	Extract the necessary information. Represent unknowns as variables, such as x,y,z. Illustrate the numbers in terms of pictures. For example, draw 5 balloons. If person 2 has twice as many balloons as person 1, draw a question mark inside the balloon to represent the unknown amount and write "x 2" to suggest that you need to multiply the question mark balloon by 2 in order to get the number of balloons person 2 has.
Step Three	List out the information you have extracted one by one. Form a relationship between the pictures by drawing arrows. Remember to direct the arrows towards the subject of the question. In other words, make sure the pictures lead to the final answer.

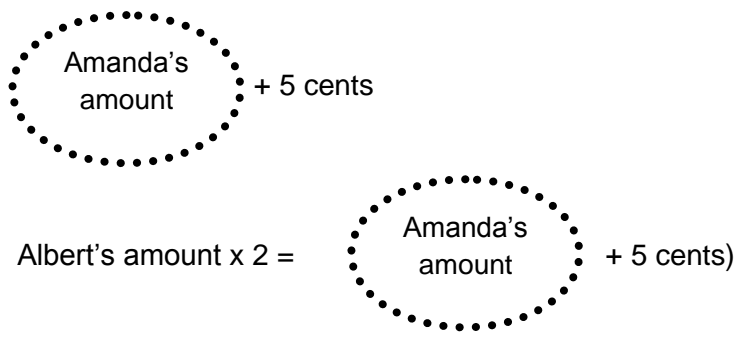
Steps	Proposed Action
Step Four	Solve the answer by following the arrows. Remember to convert the answer to the unit required, for example, kilograms, kilometres etc... as needed.

Now...let's look at an example.

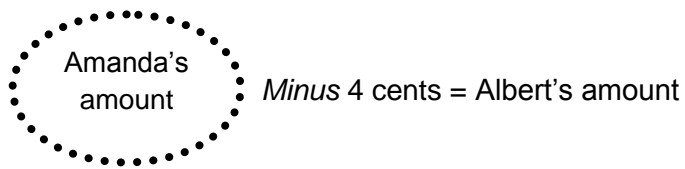
If Amanda had 5 cents more she would have twice as much as Albert. If she had 4 cents less, she would have the same amount. How many cents does Amanda have?

Steps	In Action...
Step One	Read the question.

Step Two	Extract the necessary information. If Amanda had 5 cents more she would have twice as much as Albert.
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If Amanda had 4 cents less she would have the same amount as Albert.



Amanda's currently has more cents than Albert.

Step Three	Form a relationship between the pictures. I have done so already in step 2. Now you just put them together, using statement 2.
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Steps

In Action...

A diagram showing an equation: $\text{Amanda's amount} + 5 = 2 \times (\text{Amanda's amount} - 4 \text{ cents})$. The terms "Amanda's amount" on both sides are enclosed in dotted-line circles.

Step Four

Solve.

You will find Amanda's amount equal to 13 cents. This is because we isolate out Amanda's amount by rearranging the equation.

Remember, we are trying to find Amanda's amount. Rearrange the equation by making Amanda's amount the subject.

$$\text{"Amanda's Amount"} + 5 = (2 \times \text{"Amanda's Amount"}) - 8$$

When you solve for this, the answer is 13.

You should refer to a mathematics textbook if you don't know how to rearrange equations.

4 Test Yourself

4.1 Practice Questions & Solutions

Test yourself with the practice questions provided in the insert of this book. Provide your answers on the answer sheet. Please aim to complete all 60 questions within 30 minutes. Detailed solutions are also provided in the insert of this book. For any questions that you do not get correct, it is recommended that you review sections in the book and try to understand what you could have done differently to improve your mark.