

# Preparing for the Army Officer Selection Mental Aptitude Tests

## Introduction

The Army requires that candidates for Officer Training have good mental abilities. These abilities are important for success during Initial Officer Training and for successful performance of the Officer role.

Mental ability is measured by three tests that you will complete when attending for Army Officer Selection at Westbury. These tests are referred to as the Verbal, Numerical and Abstract Reasoning Tests.

The purpose of this booklet is to:

- help you understand what you will have to do when you take the tests,
- give you a chance to have a go at the types of question you will see in the three mental ability tests and
- give you tips on how to do your best at the tests.

## Using this booklet

It is important that you take time to read this booklet before attending the Briefing Board. The first part of this booklet contains instructions for the Verbal, Numerical and Abstract Reasoning Tests followed by practice questions. The second part gives ideas about how you can develop the kinds of skills assessed by the tests and gives specific tips on how to prepare for the tests.

A couple of weeks before attending Westbury you should:

- find a quiet place where you will not be disturbed, read the instructions to each of the tests and complete the practice questions that follow.
- when you have completed the practice questions, check your answers against the solutions given at the end of this booklet. It is important that you take time to work through the solutions, as this will help you to understand the kinds of skills the tests are measuring.
- read the section on 'Developing your skills' and make time to try each of the suggested activities.

A few days before attending Westbury you should:

- review the test instructions, practice questions and solutions to the practice questions. Check that you are clear about the instructions and solutions to the practice questions.
- read the 'Test taking tips' and try to follow them when at Westbury.

## Verbal Reasoning Test

### Purpose of the test

The Verbal Reasoning Test looks at your ability to understand written information and determine what follows logically from the information. This ability is important as it is often necessary to take in new information rapidly and then make a decision, even if the decision-maker is not an expert in the area covered by the information.

### Instructions

The Verbal Reasoning test looks at your ability to think logically about written information. In this test you will see passages of text, followed by statements relating to the text. You have to read each passage of text carefully and then decide whether each statement follows logically from the information in the passage.

For each statement there are three answer options you can choose from: True, False or Can't tell.

**True**            This means that, on the basis of the information in the passage, the statement is true or logically follows from the passage.

**False**            This means that, on the basis of the information in the passage, the statement is false.

**Can't tell**        This means that you cannot tell from the information in the passage whether the statement is true or false.

When deciding on whether a statement is true, false or you can't tell, it is important to base your answer only on the information in the passage and not on any other knowledge you may have. Your task is simply to judge whether or not the statement follows logically from the passage.

Now have a go at the practice statements on the following page. Mark your answers to the practice statements in this booklet, by putting a circle around 'True', 'False' or 'Can't tell' for each statement.

When you take the Verbal Reasoning test as Westbury, you will have 40 questions to answer in 15 minutes. To gain experience of taking the test under timed conditions, you should aim to complete the 8 practice statements within 5 minutes.

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## Verbal Practice 1

In digital recording, the analogue sound that we hear needs to be translated into a series of numbers ('0' or '1'). These numbers represent the changes in air pressure over time that make up the sound, though we cannot directly 'hear' these numbers as sound.

Digital recordings are made by sending the original analogue sound to an 'analogue to digital converter' (ADC). This converter changes the analogue signal into a series of binary numbers. These numbers are then usually stored on a computer or a compact disc. During playback, the digital sound information is read and sent to a 'digital to analogue converter' (DAC) which changes the sound into an analogue signal that is reproduced by devices such as a loudspeaker or headphones.

1. A loudspeaker is able to produce an analogue signal.

True                      False                      Can't tell

2. We can hear analogue and digital information as sound.

True                      False                      Can't tell

3. To get a digital sound from a compact disc to a loudspeaker, it needs to pass through an ADC.

True                      False                      Can't tell

4. Digital recording produces a higher quality of sound than analogue recording.

True                      False                      Can't tell

## Verbal Practice 2

Positron Emission Tomography (PET) is a method that can be used to detect disease in the body. PET scanning works by giving a small amount of a radioactive drug to a patient, usually by injection. Different drugs will target different parts of the body. For example, a radioactive version of glucose will target areas where glucose is being used for energy. Sensors monitor the radiation released from the radioactive drug in the patient, and from this information a three-dimensional picture of the body is produced.

Most effective when used in conjunction with other methods of diagnosis, PET scans differ from other scanning methods as they show the body actually working. PET scans are commonly used for conditions such as cancer, epilepsy, heart disease and Alzheimer's disease, although with some patients (e.g. those with diabetes) chemical imbalances in the body may give false results.

5. PET can be used to create pictures of different parts of the body.

True                      False                      Can't tell

6. PET is one of the best methods for diagnosing conditions such as heart disease.

True                      False                      Can't Tell

7. It is necessary to inject a radioactive drug into a patient for PET to work.

True                      False                      Can't tell

8. PET is a good alternative to other, possibly less accurate methods of diagnosis.

True                      False                      Can't tell

### Numerical Reasoning Test

#### Purpose of the test

The Numerical Reasoning Test looks at your ability to use numerical information to solve problems. The test presents information in different ways (e.g. table, graph, text) and looks at the ability to pick out the right information to solve the problem and conduct basic numerical calculations. Calculators are not allowed for the Numerical Reasoning Test, so it requires calculations to be done using paper and pencil.

#### Instructions

The Numerical Reasoning test looks at your ability to solve numerical problems. You will see some numerical information followed by questions that relate to the information. For each question you are given five possible answer options. You have to work out the correct answer from the information provided and then select the corresponding answer option.

Now have a go at the practice questions on the following page. Mark your answers in this booklet, by putting a circle around the answer option you think is correct.

Calculators are not allowed for the numerical test.

When you take the Numerical Reasoning test at Westbury, you will have 36 questions to answer in 15 minutes. To gain experience of taking the test under timed conditions, you should aim to complete the 8 practice questions within 6 minutes.

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## Numerical Practice 1

A distribution centre serves stores within a 50 mile radius. The table below shows how far each store is from the distribution centre.

Distance from distribution centre	Number of stores
10 miles or less	3
11 to 20 miles	15
21 to 30 miles	26
31 to 40 miles	20
41 to 50 miles	16

1. How many stores does the distribution centre serve?

60                  70                  80                  90                  Can't tell

2. What is the most common distance of stores from the distribution centre?

10 miles          11 to 20          21 to 30          31 to 40          41 to 50  
or less            miles            miles            miles            miles

3. How many stores are 35 miles or more from the distribution centre?

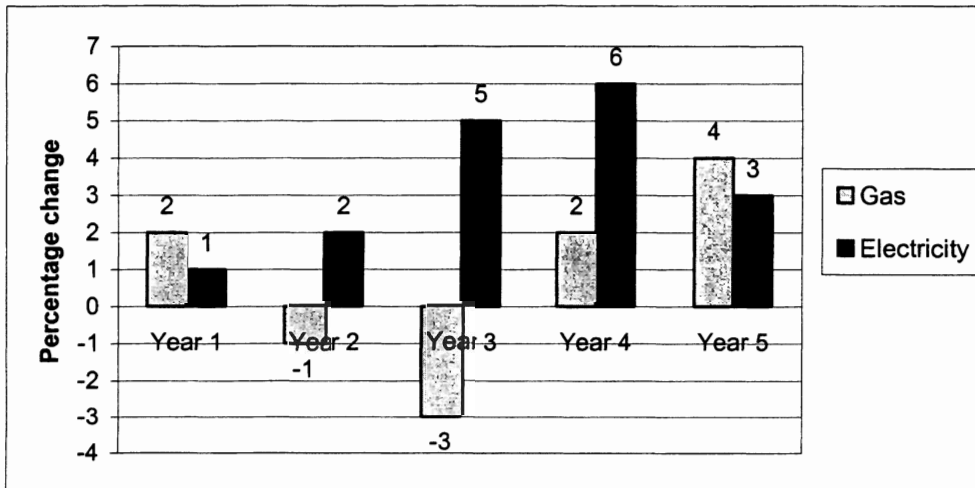
15                  16                  20                  26                  Can't tell

4. What percentage of stores are 31 miles or more from the distribution centre?

20%                25%                36%                45%                55%

## Numerical Practice 2

The graph below shows the average change in the price of gas and electricity each year over 5 years.



5. In which year did gas prices change the most?

Year 1                  Year 2                  Year 3                  Year 4                  Year 5

6. In which year was the greatest difference between the change in gas and electricity prices?

Year 1                  Year 2                  Year 3                  Year 4                  Year 5

7. At the beginning of Year 1, an annual gas bill was £320. Assuming gas usage remains the same, approximately what is the bill likely to be at the end of Year 2?

£323.14                £323.20                £326.40                £329.60                Can't tell

8. In which year did the cost of an average combined gas and electricity bill increase the most?

Year 1                  Year 3                  Year 4                  Year 5                  Can't tell

### Abstract Reasoning Test

#### Purpose of the test

The Abstract Reasoning Test looks at your ability to identify patterns and relationships between shapes. Good performance on the Abstract Reasoning test requires a number of skills important to an Army Officer:

- **The ability to generate a range of ideas** – Part of the Abstract test requires you to identify common threads and similarities between shapes. To do this, you have to show an ability to generate a variety of ideas about how the shapes may be linked. If some ideas don't work, you need the creativity to think of alternatives. It is this ability to generate new alternative ideas without getting stuck which is central to good problem-solving ability.
- **The ability to focus on relevant information** – The shapes in the Abstract test contain some features that have nothing to do with the solution to the problem. This is true in real life – problems occur with lots of information, some of which is relevant and some which is irrelevant. It is all too easy to become distracted and to spend too much time on irrelevancies. The Abstract problems allow you to show your ability to identify and focus on what is relevant.
- **The ability to switch between different types of information** – The problems in the Abstract test are very varied – some need you to look at smaller details, whereas others are more about seeing a 'bigger picture'. Some are based on simple and familiar concepts, whereas others are based on more abstract or unfamiliar concepts. This ability to switch between different types of information is another aspect of flexible and creative problem solving.
- **The ability to be analytical as well as creative** – To solve the problems in the Abstract test you need both the ability to generate alternative solutions (which requires creativity and flexibility) and the analytical skills to test out these ideas and make sure they fit clearly and precisely.

#### Instructions

On each page of the Abstract Reasoning test you will see two sets of shapes: 'Set A' and 'Set B'. All of the shapes in Set A are similar in some way, and all the shapes in Set B are similar in some way. Set A and Set B are not related to each other.

You have to work out how the shapes in Set A are related to each other and how the shapes in Set B are related to each other. You then have to work out whether further shapes belong to Set A, Set B or Neither set.

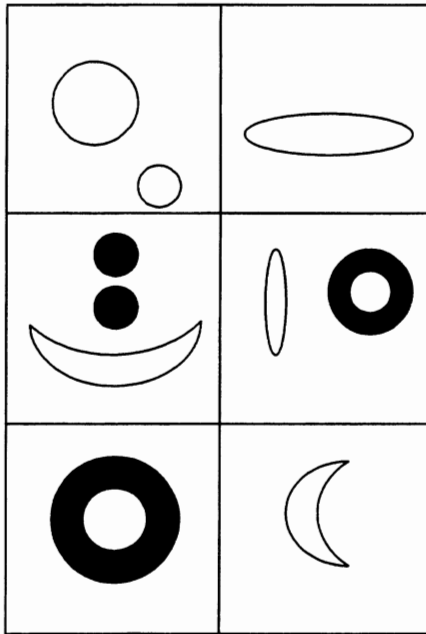
Now have a go at the practice shapes on the following pages. Mark your answers to the practice shapes in this booklet, by putting a circle around 'Set A', 'Neither' or 'Set B' for each shape.

When you take the Abstract Reasoning test at Westbury, you will have 70 questions to answer in 12 minutes. To gain experience of taking the test under timed conditions, you should aim to complete the 10 practice shapes within 3 minutes.

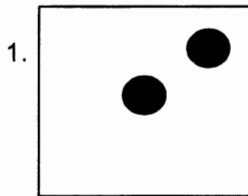
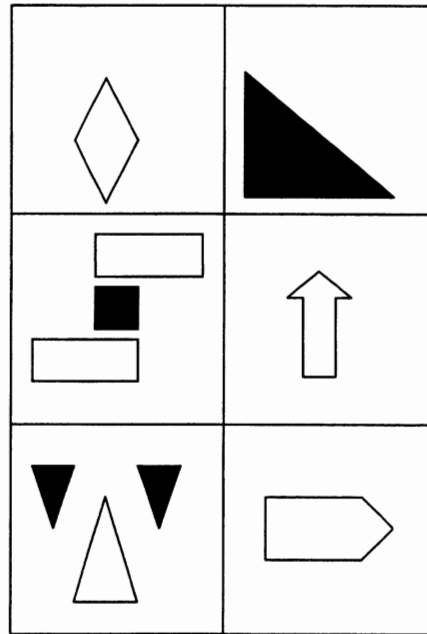
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## Abstract Practice 1

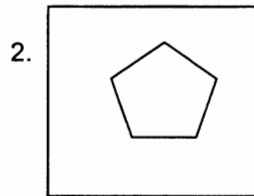
Set A



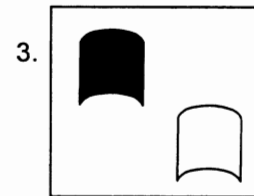
Set B



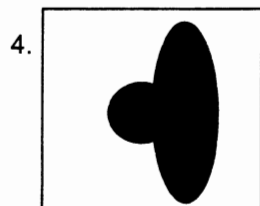
Set A   Neither   Set B



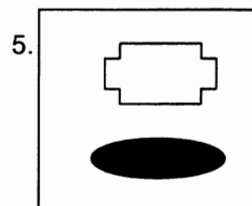
Set A   Neither   Set B



Set A   Neither   Set B



Set A   Neither   Set B

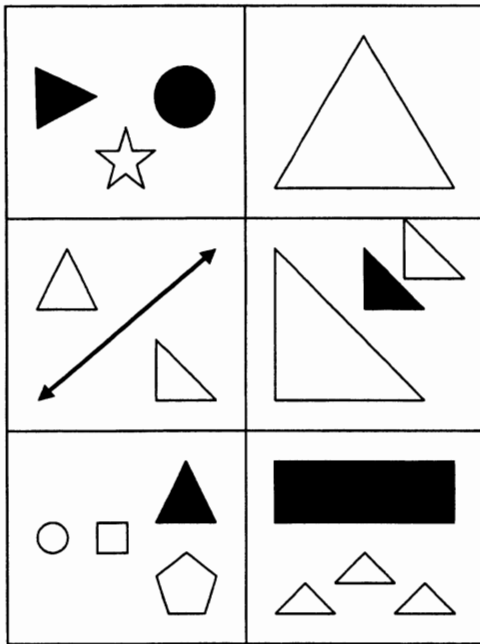


Set A   Neither   Set B

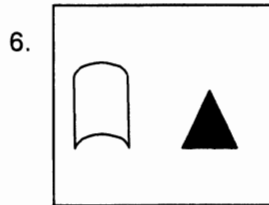
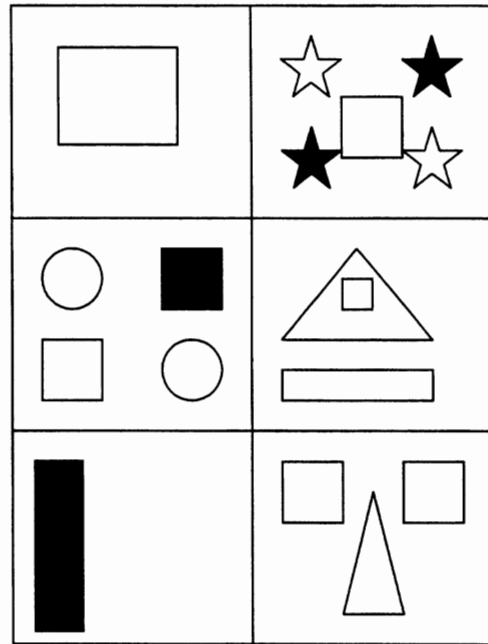
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## Abstract Practice 2

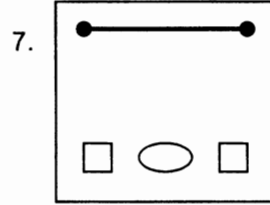
Set A



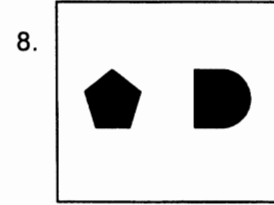
Set B



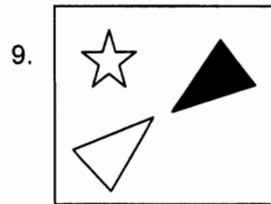
Set A    Neither    Set B



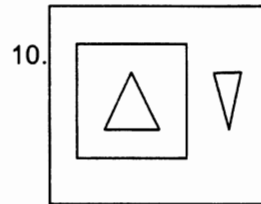
Set A    Neither    Set B



Set A    Neither    Set B



Set A    Neither    Set B



Set A    Neither    Set B



# Preparing for the Army Officer Selection Mental Aptitude Tests

## Developing your skills

Below is a checklist of activities you can do to practise the kinds of skills needed for the Verbal, Numerical and Abstract tests. The more time you spend on these activities, the more they are likely to help your test performance. In the couple of weeks before a test, try and spend at least an hour or two on the activities for each test.

### Verbal

- Take time to think carefully about arguments in newspapers, books, etc. Ask yourself questions like 'What evidence has been presented for or against the argument?', 'Is there sufficient evidence to justify the conclusion?', 'Is this argument logical?', 'How could the argument be criticised?'
- Look up the meaning of any words you are unsure of.
- When reading, think about the more complex words. What words have the same or similar meaning and so could be used instead (it may be useful to use a thesaurus)? Also, what words mean the opposite?

### Numerical

- Make sure you are generally fluent with using numbers; do simple calculations in your head or on paper rather than using a calculator.
- Practise the basic numerical functions; addition, subtraction, multiplication and division.
- Check that you are comfortable using different numerical formats and understand how to do basic conversions between formats. Useful areas to revise can include fractions, decimals, percentages, angles, ratios, area and volume.
- Take time to look at numerical information presented in different ways such as tables, graphs, pie charts and text. Make sure you understand what the information presented in these different ways is telling you.

### Abstract

- Abstract tests are usually about finding patterns and identifying categories. Spend time thinking about what features make objects alike and what features make them different.
- Books containing logic puzzles are readily available. Try buying a book of puzzles and completing them.

### Remember:

- Test-taking is a skill which can be developed. You can improve your performance with practise, so start preparing as early as you can.
- Practise timing yourself. Pacing yourself appropriately is important in timed tests and it is a skill that you can improve with practise. Practising with other people is a good way to create test conditions.
- You will take the Verbal, Numerical and Abstract tests on computer and make responses using a mouse. Make sure that you are comfortable using a mouse and practise if necessary.
- Take care of your physical health and get several good night's sleep in a row before attending Westbury.

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## Test taking tips

### On the day before the test:

- Review anything you feel you need to, but don't overdo it; set yourself a certain amount of time to do this and then allow yourself an evening doing something completely different.
- Try to build a positive mental attitude; think positively about your abilities and try to stop negative thoughts. Distract yourself by doing something that you know you will enjoy e.g. read a good book, watch a film, do something that makes you feel good about yourself.
- Eat a good meal and get a good night's sleep.

### The day of the test

- Breakfast is important but avoid 'heavy' foods which can make you feel tired during the test. Some people consider unsugared foods, such as cereal and bananas, good 'brain food'.
- Try to remain calm and to maintain a positive mental attitude.
- Don't forget to take your glasses into the test room, if you wear them.

### The test itself

- Listen to and read the test instructions carefully. If you are unclear about something, ask.
- You will be given time to read the instructions before the timed part of the test begins. Example and practice questions will also be given, so make sure you work through these carefully.
- Try not to pay attention to other people around you taking the test. Remain focused on the test.
- The tests are strictly timed, so it is important to work as quickly and as accurately as you can. If you are stuck on a question, do not waste time on it - go on to the next one and come back to it at the end if you have time.
- The best approach to multiple-choice questions is to try and work out the answer yourself, then see if your answer is one of the given options. If your answer is not one of the given options, check your reasoning or calculations. If you are absolutely stuck, make an educated guess rather than picking an answer randomly; eliminate answers you know to be wrong and then go with your best guess from the remaining options.
- Only change your answer if you are sure you have made a mistake. If you are unsure, it is probably best to stick with your first answer.

*Good luck!*

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### Verbal Reasoning – Answers to the Practice Questions

#### Statements 1 to 4

1. The correct answer to this statement is True, as the passage says that 'an analogue signal... is reproduced by devices such as a loud speaker'. A loudspeaker is therefore able to produce an analogue signal, so the statement is True.
2. The correct answer to this statement is False. The passage says that 'In digital recording, the analogue sound that we hear needs to be translated into a series of numbers... though we cannot directly 'hear' these numbers as sound'. As digital sound cannot be heard the statement is False, even though we can hear analogue sound.
3. The correct answer to this statement is False. This statement is False as the passage says that 'During playback, the digital sound information is read and sent to a 'digital to analogue converter' (DAC)' – analogue sound has to pass through a ADC when a digital recording is being made, not when being played back.
4. The correct answer to this statement is Can't tell. The correct answer to this practice statement is Can't tell as the passage says nothing about the actual quality of the sound produced from digital recording.

#### Statements 5 to 8

5. The correct answer to this statement is True. The passage states that PET forms pictures of the body from 'the radiation released from the radioactive drug in the patient', and that 'Different drugs will target different parts of the body'. From this it follows that PET can be used to create pictures of different parts of the body, making the statement True.
6. The correct answer to this statement is Can't tell. Although the passage says that PET scans are commonly used for conditions such as... heart disease', it does not say anything about whether they are one of the best methods for diagnosing such conditions, making the correct answer Can't tell.
7. The correct answer to this statement is False. The passage says that the radioactive drug is given to the patient 'usually by injection'. The word 'usually' indicates that although injection is the most common way of giving the drug, it is not the only way.
8. The correct answer to this statement is False. Key to answering this statement is the suggestion that PET is an 'alternative' to other methods, as the passage states that PET is 'Most effective when used in conjunction with other methods of diagnosis'. No information is given in the passage about the 'less accurate methods' referred to in the statement, suggesting the answer may be Can't tell. However, the clear contradiction between PET being an 'alternative' as suggested in the statement and its use 'in conjunction with other methods' from the passage, means that on balance this statement is more clearly False.

### Numerical Reasoning – Answers to the Practice Questions

#### Questions 1 to 4

1. The correct answer is 80. The correct answer is found by adding the numbers in the 'Number of stores' column, which gives a total of 80.
2. The correct answer is 21 to 30 miles, as the table shows that 26 stores are between 21 and 30 miles from the distribution centre.
3. The correct answer is Can't Tell. The table shows that 20 stores are between 31 and 40 miles from the distribution centre, but you cannot tell from the information given how many of these 20 stores are more than 35 miles from the centre.
4. The correct answer is 45%. To find the answer to this question you need to find how many stores are 31 miles or more from the distribution centre ( $20+16=36$ ), and divide this by the total

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number of stores (80) to get 0.45. To turn this into a percentage you need to multiply it by 100 to give 45%.

### Questions 5 to 8

5. The correct answer is Year 5, as the graph shows that gas prices changed the most (4%) in Year 5.

6. The correct answer is Year 3. To answer this question you need to find the difference between the percentage change for gas and the percentage change for electricity each year. The largest difference between the values is in Year 3, where the difference is 8 percentage points.

7. The correct answer is £323.14. The graph shows that gas bills increased by 2% in Year 1 (£6.40 on a bill of £320), so the gas bill at the end of Year 1 was likely to be £326.40. In Year 2, gas bills decreased by 1% (£3.26.4 on a bill of £326.40), making the likely bill at the end of Year 2 £323.14 to the nearest penny.

8. The correct answer is Can't tell. It is not possible to tell in which year the combined value of gas and electricity bills increased the most, without knowing the actual value of an average gas bill and average electricity bill. The correct answer is therefore Can't tell.

## Abstract Reasoning – Answers to the Practice Questions

### Shapes 1 to 5

1. The correct answer for this shape is Set A. All of the shapes in Set A have figures with curved edges. As the colour and number of figures in each shape varies, this is not part of the solution and so should be ignored. As this shape has two circles in it, the correct answer is Set A.

2. The correct answer for this shape is Set B. All of the shapes in Set B have straight edges. As with Set A, the number of figures and their colour varies, and so should be ignored. As this shape has straight edges, it belongs in Set B.

3. The correct answer for this shape is Neither. The figures in this shape have both curved sides (as in Set A) and straight sides (as in Set B). As this shape has features of both Set A and Set B, it is not possible to say it clearly belongs to either set and so the correct answer is Neither.

4. The correct answer for this shape is Set A. As this shape has curved sides, it belongs in Set A.

5. The correct answer for this shape is Neither. This shape has a figure with curved sides (as in Set A) and a figure with straight sides (as in Set B). Because it shares features with both sets, it is not possible to clearly classify it as belonging to Set A or Set B, so the correct answer is Neither.

### Shapes 6 to 10

6. The correct answer for this shape is Set A. All the shapes in Set A have at least one triangle that is either black or white. As this is the only common feature of the shapes in Set A, all other features should be ignored. This shape has a black triangle, so it belongs in Set A.

7. The only common feature of all the shapes in Set B is that they have at least one figure whose internal angles are all right-angles ( $90^\circ$ ), so all other features should be ignored. This shape has two squares, so it belongs in Set B.

8. The correct answer for this shape is Neither. This shape does not have any triangles (as in Set A) or any figures whose internal angles are right angles (as in Set B), and so does not fit into Set A or Set B. The correct answer is therefore Neither.

9. The correct answer for this shape is Set A. This shape has two triangles and so belongs to Set A where all shapes have at least one triangle in them.

10. The correct answer for this shape is Neither. This shape has a figure whose internal angles are all right angles (as in Set B) and two triangles (as in Set A). As this shape has features of both Set A and Set B it is not possible to clearly classify it as belonging to either set, and so the correct answer is Neither.