11 Plus Programme – CEM Maths and Non-Verbal Reasoning Boost Course Preview

This preview is designed to show you, in some depth, the work we'll go through in this course. It covers the Maths and Non-Verbal Reasoning elements of the CEM 11 Plus exam as thoroughly as possible within the time available.

Who should be doing it?

- The course is designed to boost the skills of pupils going for a CEM 11 Plus Exam.
- It should be central to the work of any child preparing at home.
- It is also very useful for any child using a tutor or going to a tuition centre.
- The course covers Maths and Non-Verbal Reasoning, with additional focus on the core skills that lead to success.

N.B. This is our shortest Maths and Non-Verbal Reasoning course. It is very intensive and ideal for those with not long to go before the exam. It is designed for preparation with 6-15 weeks to go until the exam.

Why is the course so successful?

- The course is fully planned which makes life much easier for parents than using books alone. This is especially true when time is tight.
- The course gradually introduces children to timed tests in the right way so that they build their skills and confidence as they go.
- While the course is regularly updated, the core of it has been used for many years with proven success.

Who is this course right for?

This course is ideal for any pupil with around 6-15 weeks to go until the CEM 11 Plus exam. The course is delivered in 10 parts and ideally a week would be spent on each. It could be completed in 6 weeks by working more intensively or in a more relaxed way in 15 weeks.

- **No book covers the ground so completely.**
- **This course is fully structured, revision is built in.**
- **There's much less planning work for parents to do.**

SCROLL DOWN TO SEE COURSE EXAMPLES

Make sure you understand each of the NVR question types!

11 Plus Progamme - Boost - CEM Maths and NVR - Part 3

You will now have been exposed to all nine Non-Verbal Reasoning question types. In the following parts we will revise these questions.

Maths

1. **Spot the Mistakes.** Are your mistake spotting skills are improving? When they do, your own accuracy will also improve.

2. **Revision Tests 1 and 2.** These are ion tests that you will encounter. Do not worry if you ontinue to practise them in the later weeks.

3. **Full Timed Maths Paper.** Try to g with the tests, set aside a quiet space, and stick to t ailed sheet on how to manage Maths tests before pra

4. **Decimals.** More work on this impo ular feature of 11 Plus tests.

5. **Plotting Shapes.** Become an ace at onto a graph is an essential skill for the 11 Plus.

Front Sheets

These sheets come at the front of every part of the course. They let you know what is included in each part of the course.

We let you know how to approach each activity and why it is important.

Non-Verbal Reasoning

6. **NVR Type 7 - Most Like.**

7. **NVR Type 8 - Nets.**

8. **NVR Type 9 - 3D Shapes.** Your last three Non-Verbal Reasoning question types. Please spend enough time understanding the question type and looking in detail at the five questions. If you make a mistake, it's really hy, otherwise you will not improve.

The whole course is planned for you with revision built in.

- Please sign below when you have completed everything.
- Your helper may have to test you on some things.

Signed: (Parent/Teacher and Pupil)……

We hope you enjoyed this part of the course.

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Speed and Accuracy Test

- You have five minutes. Children should be working towards scoring 100%.
- Watch out for the changes to + /÷ / - / x
- This test will be repeated five times, where mistakes are made it will be an indication that further times tables work and attention to detail is necessary.

8 + 7 =	9 – 4 =	6 x 7 =	54 ÷ 6 =	8 + 4 =
7 x 5 =				
12 – 7 =				
96 ÷ 8 =				
6 x 3 =				
5 + 8 =	14 – 9 =	0 x 8 =	8 + 6 =	12 – 8 =
5 x 6 =	44 ÷ 4 =	7 + 9 =	28 ÷ 7 =	9 x 6 =
5 + 7 =	15 – 6 =	48 ÷ 6 =	5 + 4 =	64 ÷ 8 =
16 – 8 =	36 ÷ 9 =	8 + 8 =	42 ÷ 7 =	7 x 7 =
7 x 6 =	9 – 6 =	72 ÷ 9 =	9 + 8 =	108 ÷ 9 =

Speed and Accuracy Tests

At the beginning of the course we spend time exposing whether pupils have sufficiently solid core skills. As these skills provide the fundamental basis from which children will develop, ensuring these are well established will aid them during the other sections of the course.

Score /50

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Spot the Mistakes - Maths

- Victor has completed his Mental Maths task but unfortunately he's made a number of mistakes. His answers are underlined.
- Circle the mistakes. See if you can work out what he might have done wrong

① 300 + = 1050mm

② 2 ½ Kg

③ £1.00 – 58p = 42p

④ Find the sum of £1.15 and £2.85 =

⑤ Find th costing 90m = 290m

⑥ What is the product of 9 + 99 = 108

⑨ 116mm = 11cm 6mm

⑩ ¼ of £4.16 = £1.04

⑫ What is the product of 8 and 50 = 58

Spot the mistakes

We also use other accuracy tests like this Spot the Mistakes test. Children that cannot work accurately will not do well in an 11 plus exam because of the time pressure.

Find the mistakes

Helping children to switch on their self-checking skills helps them work more accurately in the exam.

Marks /

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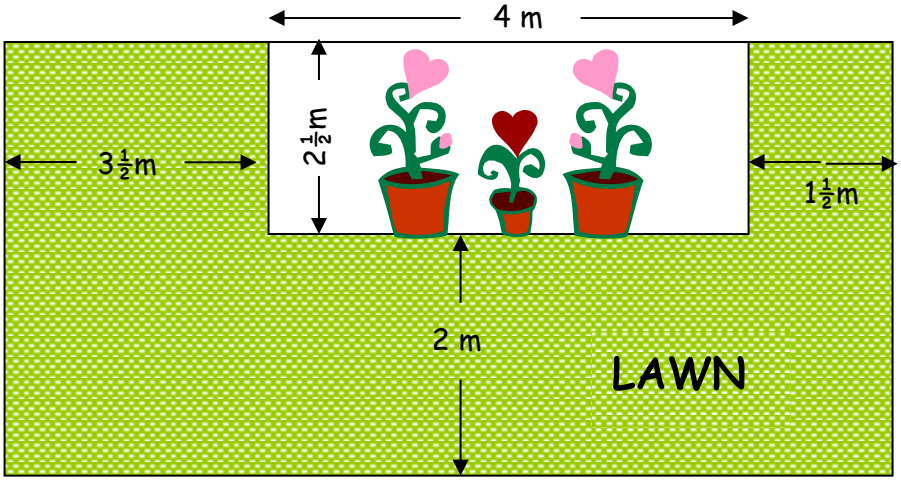
Area Problems

A rectangular garden comprises a rectangular flowerbed surrounded on three of its sides by a lawn.

Answer the following questions which relate to this diagram.



Area Problems

We also make sure we cover the core topics children may get questions on. This sheet is one we use to help children learn about area.

a)

b)

c) arden.

Answer:_____

d) Work out, in square metres, the area of the flowerbed.

Answer: _____

e) What is the area of the lawn?

Answer: _____

f) Find the cost of re-sowing the lawn if grass seed costs £1.86 for each square metre of lawn.

Answer: _____

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The BODMAS Rule

The rule for the order in which you conduct calculations is: **BODMAS**

This means:
Brackets **O**rders **D**ivision **M**ultiplication **A**ddition **S**ubtraction.

In other words:

1. You must work out the sum in the **B**racket first and then complete any **O**rders (this also means indices, powers, or roots e.g. 3^2).

2. Next you must work out any **D**ivison or **M**ultiplication.

3. Finally complete any **A**ddition or **S**ubtraction required.

Remember – if a number appears immediately before a bracket it means you must **M**ultiply (the result of the sum in the bracket) by that figure, so: 5(3.1 + 1.9) means 5 x (3.1 + 1.9) = 5 x 5 = 25

Here is an example of the **BODMAS** rule in action:

6(1.2 + 0.8) – (4.6 - 1.6) Do the **B**racket sums first
= 6 x 2 – 3
= 12 – 3
= 9 ✓

BODMAS
As part of each topic introduction/review we include further work and examples to ensure knowledge has sunk in properly.

Now look at this question:

6(2.36 + 5.62) =

6(2.36 + 5.62) = Do the **B**racket sum first - 2.36 + 5.62 = 7.98
6 x 7.98 = 47.88 ✓ Then **M**ultiply

Please file this away safely because you will need to refer to it again.

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Mathematics Revision Test 2

1. 323.76 + 19 hundredths
   = _____

2. Draw a hexagon in this space:

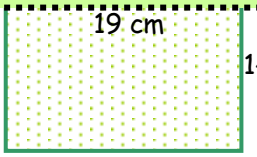
3. 13^2 = _____

4. Draw an obtuse angle – label it.

5. Draw a rhombus

6.

7.

8. 

Find the area of this shape:
= _____

9. 4.9 L = _____ mls

10. Write 555 tenths as a decimal = _____

11. 9 squared = _____

12. 12 x 8 = _____

13. 6 x 7 = _____

14. 9 x 6 = _____

15. How many tenths in 23.9?

Maths Revision Tests

Throughout the course we ensure children are using the skills they have regularly. This is an example of our regular revision test sheets. These sheets cover a great deal of the syllabus and little by little help to consolidate knowledge and give children confidence.

NO/YES

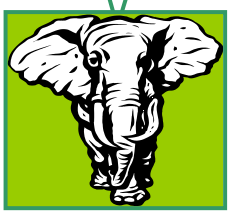
20. How many lines of symmetry has a hexagon?
    = _____

SCORE BOX:

Maths Revision Tests

With Maths it's essential that children use their skills regularly so we provide enough of these and other pages to ensure children are working at the level of frequency.

how to do
long



Are you improving? YES/ANY MINUTE NOW

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5. Complete the following money problems.

a. A single bus fare to work costs £1.25. How much have I spent altogether on bus fares by the time I have returned home? _____

b. If I go to the newsagent and buy 5 magazines costing £3.99 each. How much di___

c. I___ I bought in questio___

6. Answ

a. Six squared = _____

b. The cube root of 27 = _____

c. 60% of £60.00 = _____

d. 2(p – q) when p = 4.7 and q = 2.3 = _____

e. The square root of 6 = _____

f. Two fifths of 75kg = _____

g. 4(x + y) when x = 6.1 and y = 3.8 = _____

Maths Papers

Midway through we start to give a full timed paper in each part of the course. We ask parents to ensure this is administered correctly.

7. If

a.

b.

c.

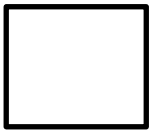
Maths Papers

Children get every opportunity to learn to complete the papers within the time allowance and the work we have done on core skills and topics means they should be focussed on accuracy.

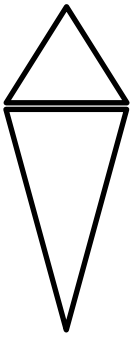
8. How many lines of symmetry do these shapes have? Some may have none.

a.

b.



c.



d.

17. When peter went to Spain recently the exchange rate was 1.2 Euros to the pound sterling. He bought a bottle of wine costing 6.7 Euros. What was the cost of the bottle in pounds sterling? (round you answer to the nearest penny).

_____

---

18. A family build a pond in their garden. When it is full it holds 9900 litres of water. The pond is filled from the garden tap which delivers a litre of water every 3 seconds. How long will it take to fill the pond? _____

---

19. Which o

A. 3.075

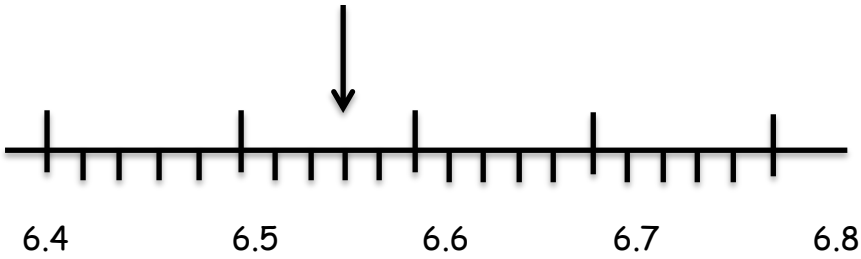
---

20. My bus
started 12 m
took 45 minutes. At what time did it arrive? _____

Maths Paper

The papers towards the end are at least as difficult as the questions they will find in the exam so they will be very well prepared. We also ensure they see a variety of different types of question to ensure they are prepared for every eventuality.

21. What measurement does the arrow point to on the scale below? _____



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22. A jar of marbles was made up like this:

	Large	Small
Black	8	14
Red	12	16

What percentage of the marbles were small? _____

Non-Verbal Reasoning

1. LIKE SHAPES / TYPE 1

In these questions you will be given an example where one shape becomes another shape. You will then be given a question shape and be asked to choose which one of five shapes it should become. You should use the example to help you choose. You should look at the example and understand exactly what changes for it to become the second shape and then apply the same reasoning to the question shape.

What to look out for

As with all Non-Verbal Reasoning question types this is largely a test of **logic** and **close observation.**

- How many si
- Are they rot
- Are they ref
- Have the sh
  diagonal line
- What size ar
- What thickn
  shapes? Bol
- Do shapes th

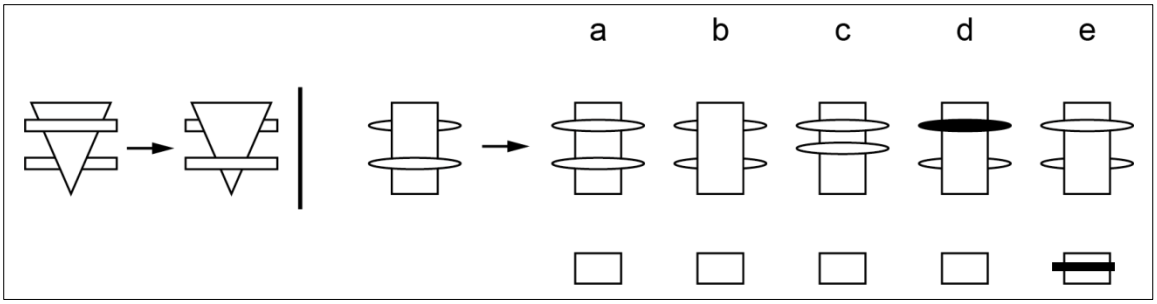
Like Shapes - Explanation

We identify the main types of non-verbal reasoning questions. We introduce each with a very detailed explanation and example. We explain what the questions entails and what children need to look out for to solve it.

Technique tips

- Focus exactly on how the first shape has changed to become the second shape, there
  than one thing may have changed.
- Make a list of the changes if necessary.
- Once you have done this look at the answer options and see which has changed in the same way.
- Often you will be left with two options which are close, there will always be a small distinguishing item which makes one of these a closer match than the other (e.g. direction of diagonal lines within a shape). You will need to renew your focus to find it.
- Unless you are doing a timed test do one question at a time. Give your answer then check if it is correct and review the explanation. This takes time but looking at the answer and explanation while the question is still fresh is the only way to learn.

Example



Explanation

There is no change in the large shape from the first set of shapes to the second. However the shape that is behind the larger moves to the front and the other shape that is in front moves behind.

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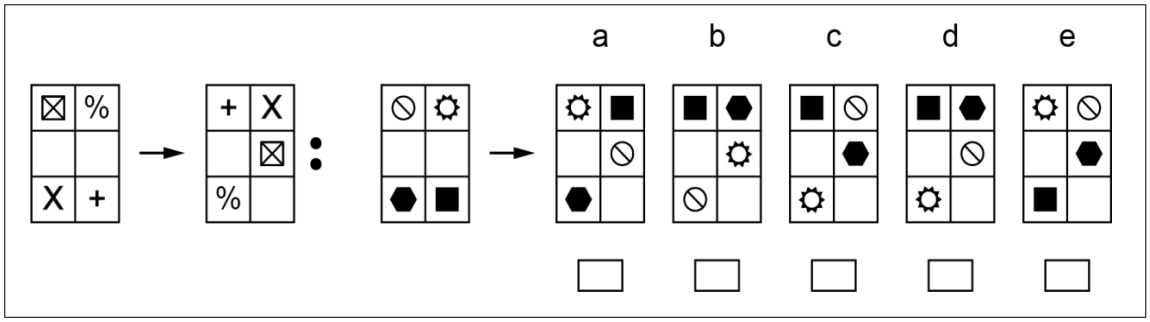
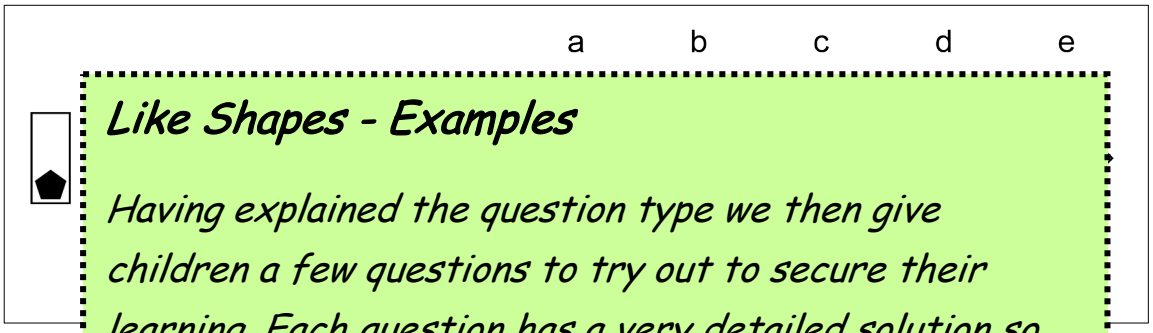
Non-Verbal Reasoning

1. LIKE SHAPES / TYPE 1

1



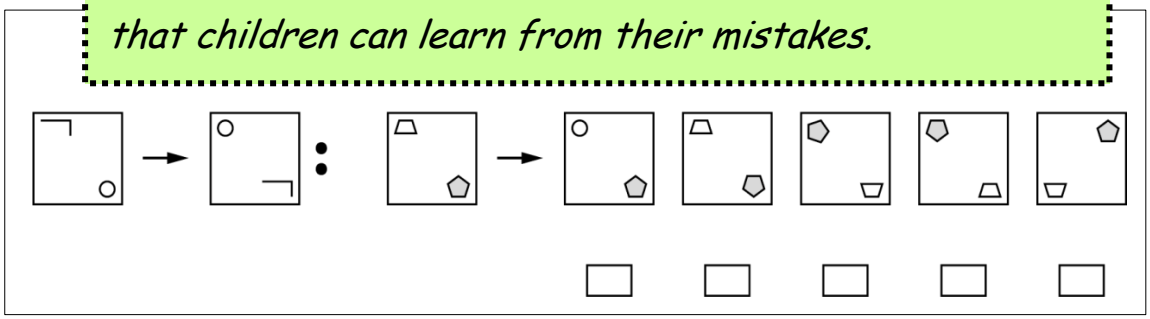
2



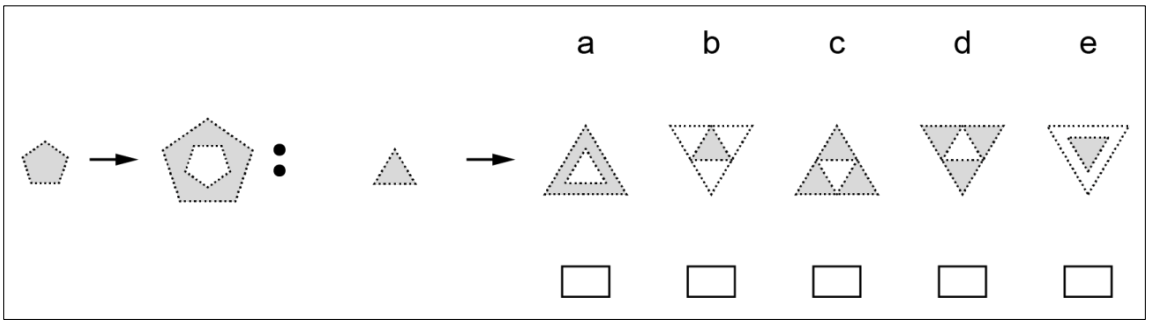
Like Shapes - Examples

Having explained the question type we then give children a few questions to try out to secure their learning. Each question has a very detailed solution so that children can learn from their mistakes.

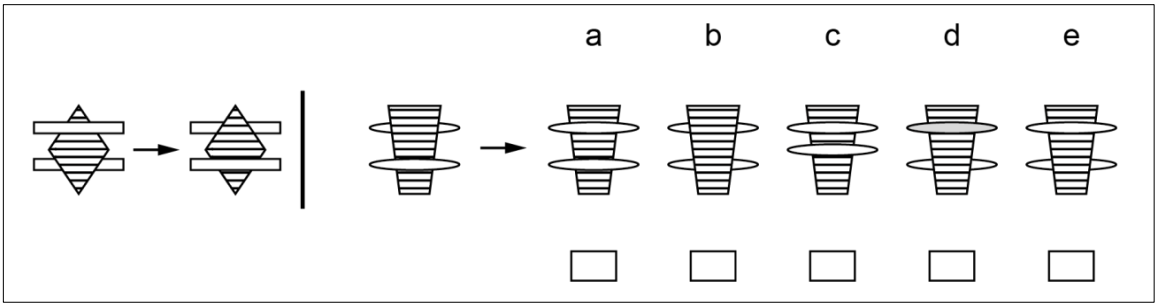
3



4



5



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11 PLUS PREPARATION

NON-VERBAL REASONING PAPER

Name:	
Date of Birth:	
Today's Date:	

READ THESE INSTRUCTIONS CAREFULLY BEFORE STARTING.

- You hav
- Mark y
- This pa xample is given a
- Each question is worth one mark. If you can't do a question, then move on.
- If you finish early check your answers for mistakes.
- Once the test has started you may not ask for help.

Timed Papers

Once we have introduced children to each of the different Non-Verbal Reasoning questions types we have identified we then start giving them timed revision tests.

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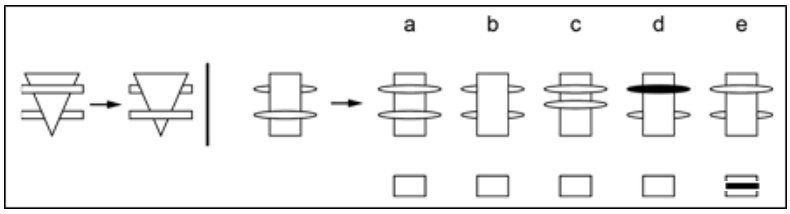
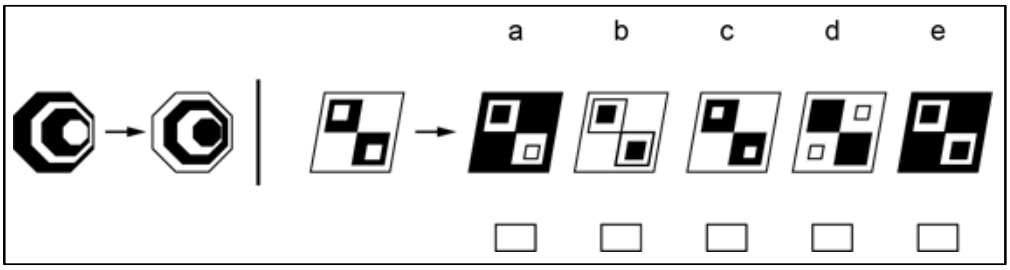
1. LIKE SHAPES / TYPE 1

Work out which of the answer shapes is related to the question shape in the same way that the example shapes are related.

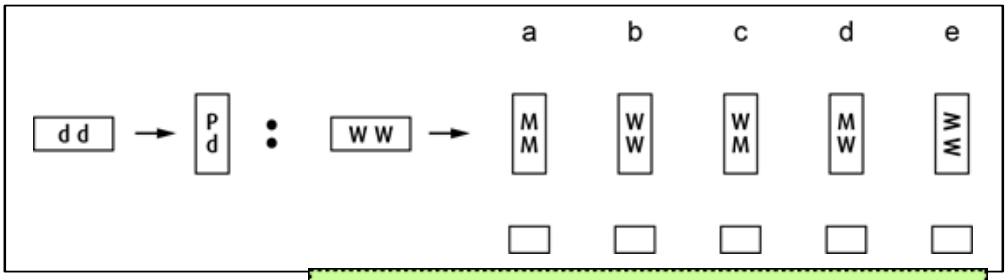
Example



1



2

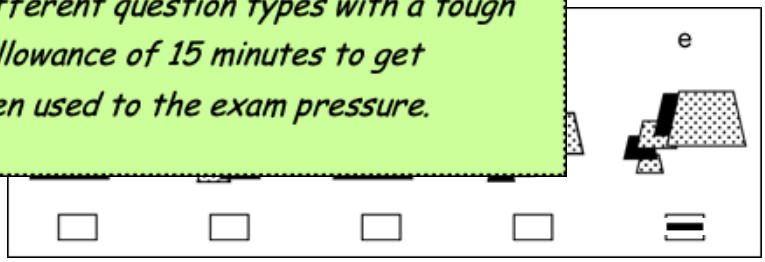


Timed Papers

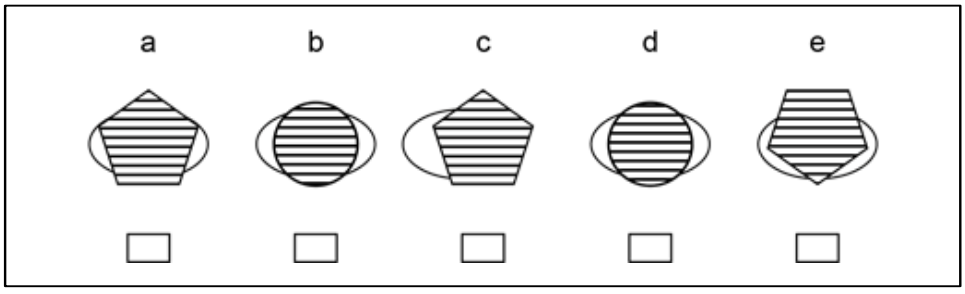
This test contains a mixture covering all the different question types with a tough time allowance of 15 minutes to get children used to the exam pressure.

2. ODD ONE OUT / TYPE 2

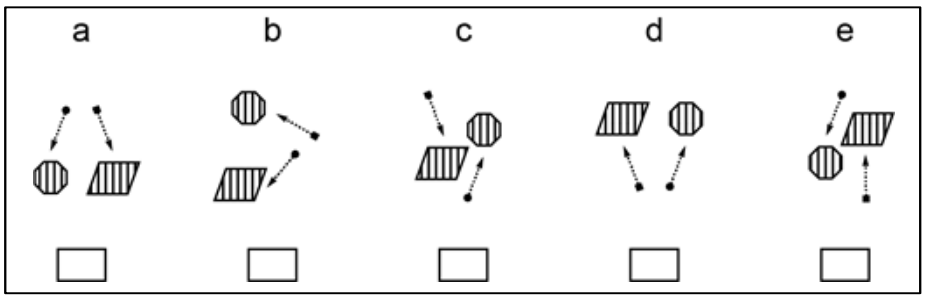
Work out which of the shapes is different to the rest.



1



2



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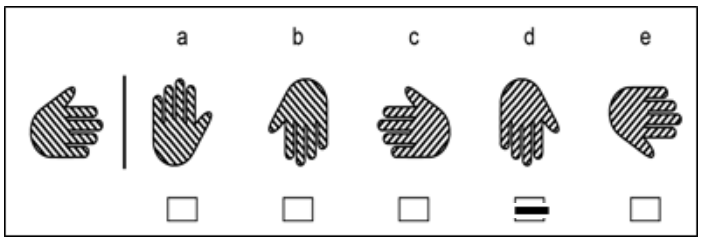
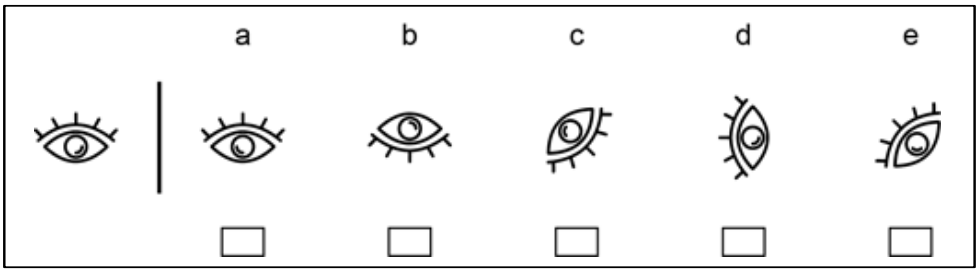
3. ROTATIONS / TYPE 3

Work out which of the answers is a rotation of the question shape.

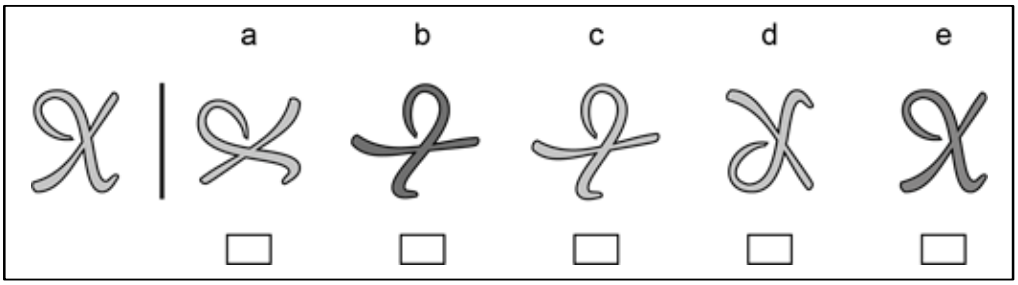
Example



1



2



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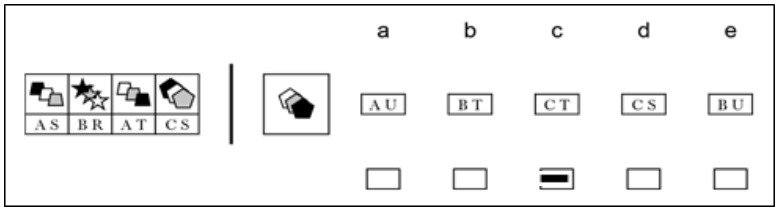
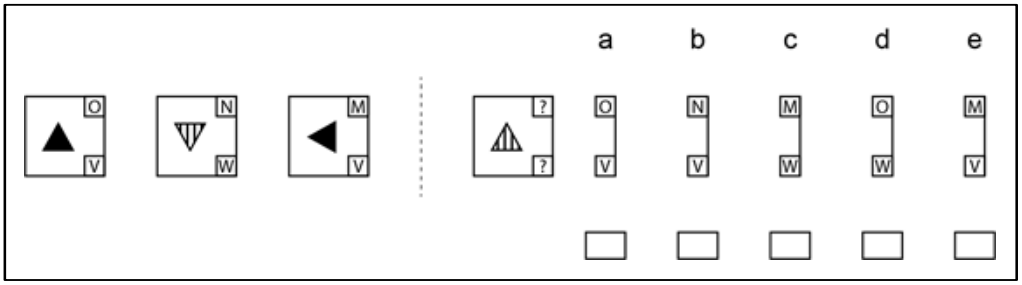
4. CODE BREAKER / TYPE 4

Look at the sequence to work out how the codes match the shapes, then select the correct answer code to match the question shape.

Example



1



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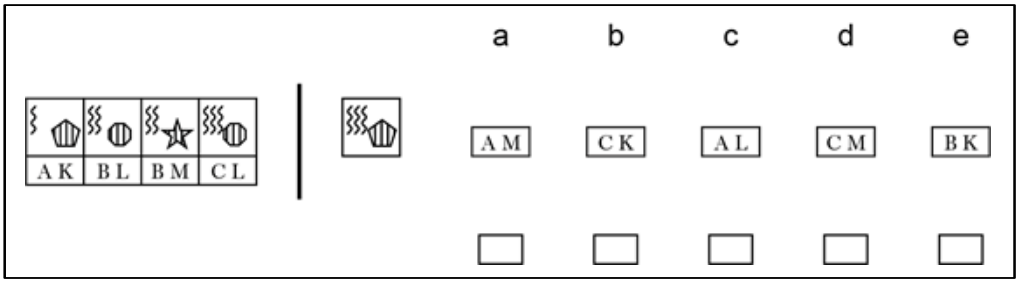

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Spot the mistakes

④ Raj may have guessed.

Remember the bottom of the fractions must be the same to add them (and we do to the top what we do to the bottom) so ….. $^{3}/_{10} + {}^{4}/_{10}$

We can now add $^{3}/_{10} + {}^{4}/_{10} = {}^{7}/_{10}$ This cannot be simplified so $^{7}/_{10}$ is the answer

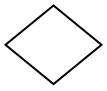
⑥ Find the product means multiply NOT add. The answer should be 138

⑧ The mistake ma
364 looks like the num
order they are not in t
1000) = 3000 not 300,
(4 x 10) = 40 not 4. So
3640

⑪ This is probably
the question properly.
2m

⑫ These question
The correct method is
question so X = (6 x 9)

Revision Test 3

1. 19
2. 49
3. 2.10
4.  (It does not matter which way up you draw this shape)
5. 
6. 15
7. 3.87
8. 18 minutes
9. 329
10. 15p
11. 8
12. 1 hour 57 minutes
13. £3.80
14. 9
15. 52
16. 2
17. 60
18. 1,2,3,4,6,8,12,24
19. 3

Full answers for every question

There are answers provided for every question in each part of the course.

Where a full detailed explanation is needed, we give it.

11. 107
12. 9.5
13. 5.9
14. 2300 ml
15. 12.6
16. 369
17. 70g
18. 61
19. 9.12
20. 3.3

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Maths Reasoning sheet

1.	15 is 3 more than / **half this number** **12 is**	24
2.	9 is 4 more than / **half this number** **5 is**	10
3.	18 is 4 less than / **twice this number** **22 is**	11
4.	36 is 8 more than / **twice this number** **28**	14
5.	45 is 9 less than/ **six times this number** **54**	9
6.	23 is 7 less than / **three times this number** **30**	10
7.	24 is 6 less than / **six times this number** **30**	5
8.	6 is 6 less than / **twice this number** **12**	6
9.	14 is 10 less than / **half this number** **24**	48
10.	4 is 11 less than / **half this number** **15**	30
11	6 is 5 times smaller than/ this number	30
12.	8 is 7 times smaller than/ this number	56
13.	200 is 20 times larger than/ this number	10
14.	If this number is made 6 times larger the answer is 42	7
15.	8 is 20 times smaller than/ this number	160
16.	14 is 7 times bigger than/ this number	2
17.	4 is 9 times smaller than/ this number	36
18.	250 is 10 times larger than/ this number	25
19.	150 is 3 times larger than/ this number	50
20.	9 is 3 times smaller than/ this number	27

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Mastering Measurement

(Answers left to right, top to bottom)

1. 0.5m
2. 50cm
3. 500mm
4. $\frac{1}{4}$m
5. 0.25m
6. 250mm
7. $\frac{3}{4}$m
8. 0.75m
9. 75cm
10. 1m
11. 100cm
12. 1000cm
13. 500g
14. 500,000mg
15. 0.5kg
16. $\frac{3}{4}$kg
17. 750g
18. 750,000mg
19. $\frac{1}{4}$kg
20. 0.25kg
21. 250g
22. 50cl
23. 500ml
24. 0.5l
25. $\frac{1}{4}$l
26. 250ml
27. 25cl
28. 0.75l
29. 750ml
30. 75cl

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ANSWERS – MATHS BOOST – PART 4

Maths type 1 paper 2

Page 1

1.
a. 4/11
b. 7/11
c. 4/11
d. 3/11

2.
a. 5.27
b. 3.31
c. 8.57

3.
a. 32
b. 1056
c. 6.08
d. -3

4.
a. 1/2
b. 4/5
c. 13/200
d. 3/4
e. 1/4
f. 79/100

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5.
a. pear
b. 13
c. coke
d. 1
e. pepsi and lemonade
f. 53

6.
a. 13:35
b. 2:55am
c. 02:55
d. 1) 9:56pm 2) 21:56

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7.
a. 8.65
b. 16.02
c. 136.50
d. 542.89

8.
a. prime – 3,5,11,19, and 43
b. not prime - 6,9,27,36,51 and 54

9.
a. 14
b. 28
c. 70
d. 17.5
e. 42

10.
a. 0.228
b. +1
c. 8
d. 59mm

Page 4

10.
e. £5.12
f. 92gm
g. 4^2
h. -2
i. 0.50litres
j. $\sqrt{58}$

11.
a. 160°
b. 65°
c. 124°
d. 74°
e. 110°

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12.
a. Cara
b. 1.39kg
c. 7.72kg
d. 5.77kg
e. 4.67kg

13.
a. 90km
b. 5cm
c. 60km
d. 10cm
e. 180km
f. 45km
g. 8km

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