BROAD HORIZON
TUITION CENTRE

11+ Tuition – Year 5

Week 7

ANSWERS

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Core refresher- Week 7 FDP Conversions

Converting Decimals to Percentages Answers

Convert the following decimals to their equivalent fractions. Please write the fractions in their simplest form, where possible. The first one has been done for you.

1. **0.27= 27/100**
2. **0.50= 1/2**
3. **0.30= 3/10**
4. **0.64= 16/25**
5. **0.55= 11/20**
6. **0.60= 3/5**
7. **0.45= 9/20**
8. **0.80= 4/5**
9. **0.10= 1/10**
10. **0.66= 33/50**
11. **0.54= 27/50**
12. **0.35= 7/20**
13. **0.51= 51/100**
14. **0.89=89/100**
15. **0.79=79/100**
16. **0.71=71/100**
17. **0.49=49/100**
18. **0.17= 17/100**

Converting Decimals to Percentages Answers

Convert the following decimals to their equivalent fractions. Please write the fractions in their simplest form, where possible. The first one has been done for you.

1. **0.86= 43/50**
2. **0.38= 19/50**
3. **0.54= 27/50**
4. **0.06= 3/50**
5. **0.46= 23/50**
6. **0.22= 11/50**
7. **0.87= 87/100**
8. **0.25= 1/4**
9. **0.14= 7/50**
10. **0.32= 8/25**
11. **0.72= 18/25**
12. **0.74= 37/50**
13. **0.70= 7/10**
14. **0.95= 19/20**
15. **0.20= 1/5**
16. **0.80= 8/10**
17. **0.36= 9/25**
18. **0.95= 19/20**
19. **0.12= 3/25**
20. **0.35= 7/20**
21. **0.38= 19/50**
22. **0.45= 9/20**
23. **0.96= 24/25**
24. **0.09= 9/100**
25. **0.61= 61/100**
26. **0.55= 11/20**
27. **0.60= 3/5**

Converting Decimals to Percentages Answers

1. 1.78= 1 39/50
2. 0.73= 75/100
3. 0.05= 1/20
4. 1.65= 1 13/20
5. 0.08= 2/25
6. 0.07= 7/100
7. 1.81= 81/100
8. 1.55= 1 11/20
9. 1.38= 1 19/50
10. 1.41= 1 41/100
11. 0.84= 21/25
12. 0.22= 11/50
13. 0.27= 27/100
14. 1.47= 47/100
15. 1.69= 1 69/100
16. 1.73= 1 73/100
17. 0.55= 11/20
18. 0.05= 1/20
19. 0.38= 19/50
20. 1.31= 1 31/100
21. 1.12= 3/25
22. 1.17= 17/100
23. 0.11= 11/100
24. 0.71= 71/100
25. 1.53= 1 53/100
26. 1.24= 1 6/25
27. 0.49= 49/100

Converting decimal tenths and hundredths to Fractions:

Answers:

A. Write these decimals into the place value chart. Read the place value and write the decimal as a fraction. The first question has been completed for you.

Converting decimals tenths and hundredths to fractions couldn't be easier - all you need is a place value chart! To convert from a decimal into a fraction, we write the number on the place value chart then **read the number off the place value chart**.

0.7=

Ones		tenths
0	.	7

No ones and 7 tenths. So the fraction is... $\frac{7}{10}$!

A. Write these decimals into the place value chart. Read the place value and write the decimal as a fraction. The first question has been completed for you.

Decimal	Place Value Chart			How many tenths?
0.7	Ones		tenths	7 tenths = $\frac{7}{10}$
	0	.	7	
0.3	Ones		tenths	**3 tenths= 3/10**
		.		
zero point two	Ones		tenths	**2 tenths= 2/10**
		.		
0.4	Ones		tenths	**4 tenths= 4/10**
		.		
0.1	Ones		tenths	**1 tenth= 1/10**
		.		
0.9	Ones		tenths	**9 tenths= 9/10**
		.		
zero point eight	Ones		tenths	**8 tenths= 8/10**
		.		

Working with hundredths is similar except we need to include the tenths too. There are 10 hundredths in a tenth.

O		t	hundredths
0	.	7	3

We have 73 hundredths - therefore $\frac{73}{100}$

B. Complete the table.

Decimal	Place Value Chart				How many hundredths?
0.73	Ones		tenths	hundredths	73 hundredths = $\frac{73}{100}$
	0	.	7	3	
0.20	Ones		tenths	hundredths	**20 hundredths= 20/100**
	0	.			
zero point four six	Ones		tenths	hundredths	**46 Hundredths= 46/100**
	0	.			
nought point nought 4	Ones		tenths	hundredths	**4 hundredths= 4/100**
	0	.			
0.42	Ones		tenths	hundredths	**42 hundredths= 42/100**
	0	.			
0.66	Ones		tenths	hundredths	**66 hundredths= 66/100**
	0	.			
0.99	Ones		tenths	hundredths	**99 hundredths= 99/100**
	0	.			

C. What do you think this decimal is as a fraction?

O		t	h	th
0	.	0	0	7

7 thousandths= 7/1000

Converting decimals to percentages Answers:

Convert the following decimals to their equivalent percentages. The first one has been done for you.

1. 0.40 = 40%
2. 0.52 = 52%
3. 0.26 = 26%
4. 0.22 = 22%
5. 0.23 = 23%
6. 0.50 = 50%
7. 0.90 = 90%
8. 0.85 = 85%
9. 0.74 = 74%
10. 0.62 = 62%
11. 0.54 = 54%
12. 0.33 = 33%
13. 0.15 = 15%
14. 0.80 = 80%
15. 0.65 = 65%
16. 0.55 = 55%
17. 0.20 = 20%
18. 0.25 = 25%

Converting decimals to percentages Answers:

Convert the following decimals to their equivalent percentages. The first one has been done for you.

1. 1.51= 151%
2. 0.75= 75%
3. 0.83= 83%
4. 1.75=175%
5. 0.07=7%
6. 0.75=75%
7. 1.43=143%
8. 1.13=113%
9. 0.41=41%
10. 1.64=164%
11. 1.33=133%
12. 0.45=45%
13. 1.72=172%
14. 0.02=2%
15. 1.65=165%
16. 0.43=43%
17. 0.77=77%
18. 1.58=158%
19. 1.06=106%
20. 0.16=16%
21. 0.48=48%
22. 0.91=91%
23. 1.22=122%
24. 0.03=3%
25. 0.93=93%
26. 0.18=18%
27. 1.83=183%

Converting percentages to decimals Answers:

Convert the following percentages to their equivalent decimals. The first one has been done for you.

1. 27%=0.27
2. 19%=0.19
3. 80%=0.80/0.8
4. 74%=0.74
5. 92%=0.92
6. 86%=0.86
7. 40%=0.40/0.4
8. 42%=0.42
9. 29%=0.29
10. 71%=0.71
11. 74%=0.74
12. 78%=0.78
13. 59%=0.59
14. 77%=0.77
15. 33%=0.33
16. 95%=0.95
17. 88%=0.88
18. 37%=0.37

Convert the following percentages to their equivalent decimals. The first one has been done for you.

1. 6%=0.06
2. 58%=0.58
3. 74%=0.74
4. 192%=1.92
5. 112%=1.12
6. 10%=0.1/0.10
7. 5%=0.05
8. 183%=1.83
9. 168%=1.68
10. 110%=1.1/1.10
11. 3%=0.03
12. 120%=1.2/1.20
13. 123%=1.23
14. 138%=1.38
15. 57%=0.57
16. 41%=0.41
17. 78%=0.78
18. 87%=0.87
19. 119%=1.19
20. 2%=0.02
21. 135%=1.35
22. 91%=0.91
23. 167%=1.67
24. 1%=0.01
25. 187%=1.87
26. 18%=0.18
27. 83%=0.83

Converting percentages to decimals Answers:

Convert the following fractions to their equivalent percentage. The first one has been done for you.

1. $\frac{8}{100}$ = 8%
2. $\frac{42}{100}$ = **42%**
3. $\frac{27}{100}$ = **27%**
4. $\frac{49}{100}$ = **49%**
5. $\frac{22}{100}$ = **22%**
6. $\frac{71}{100}$ = **71%**
7. $\frac{9}{100}$ = **90%**
8. $\frac{32}{100}$ = **32%**
9. $\frac{55}{100}$ = **55%**
10. $\frac{78}{100}$ = **78%**
11. $\frac{24}{100}$ = **24%**
12. $\frac{8}{10}$ = **80%**
13. $\frac{99}{100}$ = **99%**
14. $\frac{65}{100}$ = **65%**
15. $\frac{8}{20}$ = **40%**
16. $\frac{69}{100}$ = **69%**
17. $\frac{73}{100}$ = **73%**
18. $\frac{86}{100}$ = **86%**
19. $\frac{20}{100}$ = **20%**
20. $\frac{60}{100}$ = **60%**
21. $\frac{9}{20}$ = **45%**
22. $\frac{17}{100}$ = **17%**
23. $\frac{65}{100}$ = **65%**
24. $\frac{7}{10}$ = **70%**
25. $\frac{22}{100}$ = **22%**

Challenge:

26. $\frac{4}{50}$ = **8%**
27. $\frac{13}{20}$ = **65%**
28. $\frac{5}{25}$ = **20%**
29. $\frac{45}{50}$ = **90%**
30. $\frac{5}{100}$ = **50%**

Find the Equivalent Fractions – Answers

Fill in the numerator to make the fractions equivalent.

Question	Answer
1	2
2	2
3	2
4	2
5	6
6	2
7	2
8	4
9	6
10	4
11	14
12	6

Question	Answer
13	8
14	10
15	38
16	12
17	10
18	4
19	6
20	8
21	10
22	14
23	36
24	22

Find the Equivalent Fractions – Answers

Fill in the numerator to make the fractions equivalent.

Question	Answer
1	4
2	5
3	16
4	5
5	8
6	8
7	1
8	16
9	1
10	6
11	20
12	4

Question	Answer
13	5
14	1
15	6
16	2
17	4
18	10
19	6
20	10
21	5
22	2
23	1
24	6

Starter Task – Quick Revision

STARTER TASK ANSWERS

1) What number is MCMLXXXVII ? **1987**

2) Write 2499 in Roman Numerals **MMCDXCIX**

3) Workout 40% of 250 = **100**

4) Workout 35% of 300 = **105**

5) Workout 65% of 400 = **260**

6) Workout 85% of 70 = **59.5**

7) What is $\frac{2}{5}$ of 800ml ? **320ml**

8) What is $\frac{5}{7}$ of 448kg **320kg**

9) What is $\frac{3}{8}$ of 3832ml **1437ml**

10) What is $\frac{3}{4}$ of 2348g **1761g**

Starter task – Vocabulary Homework Test

Exercise C

1. Enrage
2. Defendant
3. Frantic
4. Aghast
5. Discipline
6. Articulate
7. Reinforce
8. Legal
9. Inferior
10. Brittle

Practice – Long Maths Word Problems

Test 13 — pages 42-44

1. D
The 5 is in the hundred thousands column, so it represents five hundred thousand.

2. 3 years
31 536 000 seconds is approximately 30 000 000, so you need to work out how many go into 100 000 000. This is the same as working out how many 30s go into 100. The answer is 3.

3. 2:3
Maja has 5 + 3 = 8 shirts and 9 + 3 = 12 jumpers. So the ratio of shirts to jumpers is 8: 12, which is the same as 2: 3.

4. E
The angle between the page and the line is less than 90°, so you can rule out answers A, B, C and D, leaving only E.

5. 12 minutes
The first journey is 8 minutes long, the second is 9 minutes, the third is 5 minutes and the fourth is 12 minutes long. So the longest is 12 minutes.

6. 11 minutes
Add up the time each journey takes and divide by the number of journeys. 10 + 12 + 9 + 13 = 44. 44 ÷ 4 = 11 minutes.

7. C
3 litres paints 24.6 m², so 300 litres paints 2460 m². 150 is half 300, so divide by 2. 2460 ÷ 2 = 1230 m².

8. 380 cm³
Each tile has a volume of 5 × 4 × 0.5 = 5 × 2 = 10 cm³. In total there are 25 + 13 = 38 tiles, so the volume of the pile is 38 × 10 = 380 cm³.

9. 400
The coin landed heads 480 ÷ 6 times. 48 ÷ 6 = 8, so 480 ÷ 6 = 80. So it landed tails 480 − 80 = 400 times.

10. C
The area of the lawn is $\frac{1}{2}$ × 16 × 21 = 8 × 21 = 168 m² (use partitioning here). One tub fertilises 30 m² of lawn, so use partitioning to divide 168 by 30. 168 = 150 + 18. So for 150 m², 150 ÷ 30 = 5 tubs are needed. This leaves 18 m² remaining, so 1 more tub is needed. 5 + 1 = 6 tubs are required.

11. B
On Monday Charthought of −2. On Tuesday her number was −2 × 3 = −6. On Wednesday it was −6 × 3 = −18 and on Thursday it was −18 × 3 = −54, which is less than −40.

12. 80
The number of boys in the year is 240 ÷ 3 = 80. $\frac{1}{4}$ of 80 is 80 ÷ 4 = 20, so 20 boys have green eyes. There are 240 − 80 = 160 girls, and the number of girls with green eyes is $\frac{3}{8}$ × 160. $\frac{1}{8}$ of 160 is 160 ÷ 8 = 20, so $\frac{3}{8}$ is 20 × 3 = 60. So the total number of children with green eyes as 20 + 60 = 80.

Test 14 — pages 46-48

1. 185
15 more pupils took the red ferry on the way back than the way there. So 15 fewer pupils must have took the blue ferry on the way back. This gives 200 − 15 = 185.

2. D
On the first day she has 20 stickers. On the second day, she has 20 − 3 = 17 stickers. On the third day she has 17 − 3 = 14. On the fourth day she has 14 − 3 = 11. On the fifth day she has 11 − 3 = 8 stickers. This is fewer than 10, so the answer is D.

3. 7.00 °C
The highest value is 4.20 °C and the lowest is −2.80 °C. This gives 4.20 − (−2.80) = 4.20 + 2.80 = 7 °C.

4. A

Writing out the values in order gives: −2.80, −1.96, 2.92, 3.43, 4.20. The fourth value in this list is 3.43 °C.

5. 36 m

A heptagon has 7 sides, so divide the perimeter by 7.
Use partitioning: 252 = 210 + 42.
So 252 ÷ 7 = 210 ÷ 7 + 42 ÷ 7 = 30 + 6 = 36.

6. 102 cm^3

Each block is 2 × 1 × 3 = 6 cm^3. The total volume is 6 × 17 = 6 × 10 + 6 × 7 = 60 + 42 = 102 cm^3.

7. 4

To find the missing bar, add up the bars that Elodie drew and subtract from the number of pupils.
5 + 7 + 8 + 6 + 7 + 8 = 41. 45 − 41 = 4.

8. A

The car travelled 54.1 × 8.76 miles. Rounding these to the nearest 10 gives 50 × 10 = 500 miles.
The nearest answer is A.

9. E

48 ÷ 8 = 6, so Martha needs to divide all her quantities by 6 to make 8 cakes. For eggs, this gives 36 ÷ 6 = 6 eggs. For flour; 18 ÷ 6 = 3 kg of flour.

10. £44.80

48 ÷ 3 = 16, so Martha made 0.80 × 16 = £12.80 from $^1/_3$ of the cakes. 48 − 16 = 32 cakes, so Martha made 32 × 1 = £32 from the rest of the cakes. So in total she made 12.80 + 32 = £44.80.

11. D

n is multiplied by 3, giving $3n$. Then 3 is subtracted from $3n$, giving $3n - 3$.

12. 13

$3n - 3$ gives 36, so 36 is 3 less than $3n$. So $3n$ is 39.
The number that you multiply by 3 to get 39 is 13.

Test 7 — pages 22-24

1. D
A triangular prism has three rectangular and two triangular faces, so only B or D are possible. The triangular faces must be on opposite sides of the rectangles, so only D will work.

2. 370 ml
The largest value is 1242 ml, and the smallest is 872 ml. Using partitioning: 1242 − 872 = 1242 − 42 − 800 − 30 = 1200 − 800 − 30 = 400 − 30 = 370.
So the difference is 370 ml.

3. B
$^1/_5 \times 60 = 60 \div 5 = 12$. So $^2/_5 \times 60 = 12 \times 2 = 24$.

4. 17 cm
A rhombus has 4 equal sides, so each side is 68 cm ÷ 4. Using partitioning: (40 ÷ 4) + (28 ÷ 4) = 10 + 7 = 17.

5. £1.37
£5.00 − £3.63 = £1.37 (use partitioning).

6. C
The total of the 5 values is: 1.5 + 2.8 + 0.6 + 1.4 + 2.2 = 8.5 kg. Using partitioning: 8.5 ÷ 5 = (5 ÷ 5) + (3.5 ÷ 5) = 1 + 0.7 = 1.7. So the mean is 1.7 kg.

7. 99
50% of 180 = 180 ÷ 2 = 90.
5% = 50% ÷ 10, so 5% of 180 = 90 ÷ 10 = 9.
So 55% of 180 = 90 + 9 = 99.

8. 44
Each cake symbol is worth 8 cakes. There are $5^1/_2$ symbols in total for Monday and Tuesday. $5^1/_2 \times 8$ = $(5 \times 8) + (^1/_2 \times 8) = 40 + 4 = 44$ cakes.

9. 19
$a = (2 \times 13) - 7 = 26 - 7 = 19$.

10. A
It's easiest to look at the times for the third bus in the table. The time between 14:06 and 14:47 is 47 − 6 = 41 minutes.

11. 169
$12^2 = 12 \times 12 = 144$, which is below 150.
$13^2 = 13 \times 13 = 169$, which is between 150 and 190.
So 169 is the square number between the given values.

12. 18 cm³
Volume of a cuboid = length × width × height
= 3 × 4 × 1.5 = 3 × 6 = 18 cm³.

13. D
$^3/_4$ is equivalent to 0.75, so $3^3/_4$ m = 3.75 m.
1 m = 100 cm, so 3.75 m = 3.75 × 100 = 375 cm.

14. 7672
Using column addition:

```
  1274
  5876
+  522
  7672
  111
```

15. D
$n = 9$, so $(8 \times 9) - 5 = 72 - 5 = 67$.

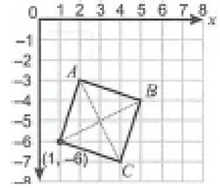
16. D
Write both fractions as improper fractions over the same denominator:
$2^1/_8 = {}^{2 \times 8 + 1}/_8 = {}^{16 + 1}/_8 = {}^{17}/_8$
$1^3/_4 = {}^{4 + 3}/_4 = {}^7/_4 = {}^{14}/_8$ (doubling top and bottom)
${}^{17}/_8 - {}^{14}/_8 = {}^{17 - 14}/_8 = {}^3/_8$.

17. 24°
The unmarked angle in the triangle lies on a straight line with the 35° angle, so it must be 180° − 35° = 145°.
Angles in a triangle add up to 180°,
so n = 180° − 145° − 11° = 35° − 11° = 24°.

18. 5
$5^3 = 5 \times 5 \times 5 = 25 \times 5 = 125$.
$3^3 = 3 \times 3 \times 3 = 9 \times 3 = 27$.
(125 + 10) ÷ 27 = 135 ÷ 27. 135 is half of 270 and 270 ÷ 27 = 10, so 135 ÷ 27 = 10 ÷ 2 = 5.

19. B
The 1 in 0.014 is in the hundredths column, and the 4 is in the thousandths column, so the fraction must be $^1/_{100} + {}^4/_{1000} = {}^{10}/_{1000} + {}^4/_{1000} = {}^{14}/_{1000}$.

20. A
The square must have 4 sides of equal length, with diagonal lines of symmetry, so the missing corner can be plotted as shown:



21. D
A translation of 6 units left reduces the x coordinate by 6, and a translation of 2 units down reduces the y-coordinate by 2. So (4, 8) becomes (4 − 6, 8 − 2) = (−2, 6).

22. 11
Use long division:

```
     3 2 r 11
13 ⌈ 4 2 7
   − 3 9
       3 7
   −   2 6
       1 1
```

English – Comprehension

Test 3 - A Modern Cinderella

Question	Answer	Source of Answer
1	B	Refer to line 1: 'Among green New England hills...'
2	D	Knowledge of vocabulary required. The word 'picturesque' means visually attractive in a charming way. Therefore, the best option is 'aesthetically ideal'.
3	D	Refer to line 3: '...a brook ran babbling through the orchard than encompassed it about...'
4	C	Refer to line 7: 'One summer morning...'
5	A	Reader's personal judgement required. Refer to the description of Nan in lines 12-13 to help form an opinion as to how Nan should be received. As she is described as 'blue-eyed' and 'soft-featured', it is likely that the reader is intended to think that she is likeable.
6	C	Refer to lines 25-26: '...for it's the only thing fit for me this hot weather.'
7	C	Knowledge of grammar required. A verb is a word that conveys an action. The action in this sentence is 'going', so the verb is 'went'.
8	C	Knowledge of vocabulary required. The word 'domestic' means existing inside a particular country or home. An antonym is a word that means the opposite of another word. Therefore, the option here that is the best antonym for 'domestic' is 'foreign'.
9	E	Reader's personal judgement required. Refer to the description of Nan in lines 52-59 to help form an opinion as to which of the given options provides the best description of her character. Words and phrases such as 'diligent' (line 52) and '...spirits would fail, though patience never' (line 59) imply that Nan is patient.
10	A	Reader's logical inference required. Refer to lines 53-59 to make a decision as to which of the given options best summarises the problem with the kitchen. Phrases such as '...rebellion broke out everywhere' (line 55) imply that it is messy and problem-filled.
11	B	Knowledge of literary techniques required. The quoted phrase is an example of a simile. A simile is a phrase that makes a comparison between two different things through a connective word such as 'like' or 'as'.
12	A	Reader's logical inference required. Refer to line 60 in the context of the passage in order to make a decision as to why Nan is 'growing hotter and wearier'. As the previous two paragraphs consist of descriptions of Nan's numerous tasks, it is likely that she is becoming hot and overworked.
13	C	Reader's personal judgement required. Refer to the referenced speech in lines 66-69 to help form an opinion as to what its main message is. By focussing on key phrases such as 'Help cometh from afar...' (line 67), it can be inferred that its main message is that 'Friends can help.'
14	B	Reader's personal judgement required. Refer to lines 70-76 to help form an opinion as to her response to John Lord. Words such as 'honest', 'kind' and 'helpful' in line 72, 'most welcome' in line 73 and 'grateful' in line 76 imply that she is grateful to see him.
15	E	Reader's personal judgement required. Look at the text as a whole to help form an opinion as to which character is the focus of the passage. As a great deal of the text is given over to describing Nan and her actions, it can be inferred that Nan is the main character in this story.

Verbal Reasoning

Choose a word

Fill in Missing Letters

Finding Hidden Facts

PAGE 20 — CHOOSE A WORD

1. **fewer** — *'Children in Victorian Britain had **fewer** toys'*
2. **nowadays** — *'than children **nowadays**'*
3. **often** — *'Whilst rich children **often** had rocking horses'*
4. **luxuries** — *'poor children couldn't afford such **luxuries**'*
5. **ingenious** — *'They found **ingenious** ways of making the toys they wanted'*
6. **from** — *'such as creating dolls **from** clothes pegs'*
7. **eager** — *'I was **eager** to start my holiday'*
8. **begrudge** — *'so I didn't **begrudge** getting up at the crack of dawn'*
9. **patience** — *'My **patience** began to wear a little thin'*
10. **delayed** — *'when the flight was **delayed** for four hours'*
11. **because** — *'**because** the pilot couldn't be found'*
12. **we** — *'It was once **we** boarded the plane that the fun really started'*

PAGE 21 — FILL IN MISSING LETTERS

1. despite — *'a bad-tempered miser who, **despite** being very rich'*
2. poor — *'refuses to help the **poor**'*
3. former — *'the ghost of this **former** business partner'*
4. change — *'he must **change** his ways'*
5. visited — *'Scrooge is then **visited** by the Ghost of Christmas Past'*
6. innocent — *'who shows him how **innocent** he was as a boy'*
7. became — *'how he **became** so cold-hearted.'*
8. mythology — *'In Greek **mythology**'*
9. mother — *'the baby Achilles was dipped in the River Styx by his **mother**'*
10. mortal — *'this part of his body was not immersed, and remained **mortal**'*
11. reputation — *'Achilles gained a **reputation** as a mighty warrior'*
12. attack — *'during an **attack** on the city of Troy'*
13. killed — *'shot in the heel with an arrow, and **killed**'*
14. weakness — *'a person's **weakness** is sometimes known as their 'Achilles heel''*
15. solitary — *'Kingsley had always been a **solitary** child'*
16. friend — *'His best **friend** was his dog'*
17. explore — *'Kingsley and Tyke set off early to **explore** the ruined castle'*
18. village — *'looming over the **village** like a dark cloud'*
19. trudged — *'As Kingsley **trudged** up the hill'*
20. chasing — *'barking joyfully and **chasing** imaginary rabbits'*
21. unease — *'his happy barks changed to whines of **unease**'*

PAGE 22 — FILL IN MISSING LETTERS

1. think — *'most people **think** of giants'*
2. ferocious — *'like the lumbering Brontosaurus or **ferocious** Tyrannosaurus rex'*
3. smallest — *'One of the **smallest** dinosaurs was the Lesothosaurus'*
4. roughly — *'and was **roughly** the same size'*
5. chicken — *'as a **chicken**'*
6. suggest — *'its long hind legs and long tail **suggest** that it was a fast runner'*
7. scientists — *'**scientists** can tell that the Lesothosaurus fed on plants'*

PAGE 23 — FINDING HIDDEN FACTS

1. **Eleanor** — *Eleanor takes part in two sports: basketball and athletics.*
2. **Rosie** — *Rosie only collects one thing: badges.*
3. **Sacha** — *Sacha has four slices: cheese and tomato, pepperoni, chicken and mushroom, and roast vegetable.*
4. **Helen** — *Helen orders three items: chips, a hot dog and a salad.*

Verbal Reasoning Tests

Paper 13 (pages 55–60)

1 **se** amuse, seven
2 **on** spoon, once
3 **am** steam, amble
4 **ve** prove, verb
5 **me** prime, medal

6–10 To solve this, we can use logic as we read each piece of information like this:
- If the Smiths live between the Johnsons and the Bradleys they must live in Number 3 or 4.
- The Browns live opposite the Smiths so they must live in Number 3 or 4.
- The Mills live in Number 2 and as the Smiths live between the Johnsons and the Bradleys, they must live on the other side of the road to the Mills. The Smiths must live in Number 3.
- The Browns live opposite the Smiths so the Browns must live in Number 4.
- The Whites do not live opposite the Bradleys, so the Whites must live in Number 6 with the Johnsons in Number 5, and the Bradleys must live in Number 1.

6 **The Bradleys** live in Number 1.
7 **The Smiths** live in Number 3.
8 **The Browns** live in Number 4.
9 **The Johnsons** live in Number 5.
10 **The Whites** live in Number 6.
11 **precise, stoop** 'Exact' and 'precise' are synonyms in the same way as are 'crouch' and 'stoop'.
12 **call, sum** 'Summon' and 'call' are synonyms in the same way as are 'total' and 'sum'.
13 **tale, gale** 'Story' and 'tale' are synonyms in the same way as are 'storm' and 'gale'.
14 **practical, rotate** 'Sensible' and 'practical' are synonyms in the same way as are 'revolve' and 'rotate'.
15 **own, sign** 'Possess' and 'own' are synonyms in the same way as are 'omen' and 'sign'.
16 **16, 30** There are two sequences which alternate. The first, third, fifth and seventh numbers follow the first sequence; the second, fourth, sixth and eighth numbers follow the second sequence. In the first sequence the number increases by 5, then 6, then 7 and so on. In the second sequence the number decreases by 1 each time.
17 **11, 19** The sequence alternately adds 5 and subtracts 2: +5, –2, +5, –2, +5, –2, +5.
18 **22, 29** There are two sequences which alternate. In the first sequence, starting with 7, the number added increases by 1 each time: +4, +5, +6. In the second sequence, starting with 17, each number in the sequence increases by 4.
19 **4, 36** This is a sequence of squared numbers from 2^2 to 9^2.
20 **13, 17** The sequence alternately adds 2 and 4: +2, +4, +2, +4, +2, +4, +2.
21 **MPTF** To get from the word to the code, move each letter forward one place.

22 **MJQ** To get from the word to the code, move each letter forward one place.

23–25 To move from the word to the code, move each letter forward one place.

23 **UPF**

24 **TVN**

25 **UPUBM**

26 **15** 6 + 1 + 3 + 5 = 15

27 **10** 2 + 1 + 2 + 5 = 10

28 **17** 2 + 1 + 3 + 11 = 17

29 **18** 8 + 5 + 1 + 4 = 18

30 **feel** 'Touch' 'stroke' and 'feel' are all associated with physical contact; to feel means the same as to notice and to sense.

31 **free** Complimentary and gratis both mean the same as 'free'; to free also means to untie and release.

32 **fleet** 'Fleet', 'armada' and 'flotilla' are all words meaning a group of boats or ships; 'fleet' is also a synonym for 'rapid' and 'fast'.

33 **fit** The adjective 'fit' means the same as 'well' and 'healthy'; the noun 'fit' is a synonym for 'spasm' and 'seizure'.

34 **find** The verbs 'find', 'discover' and 'reveal' are all linked to uncovering something; the noun 'find' also means the same as 'bargain' and 'windfall'.

35 **lard** The house was surrounded by a circu**lar d**rive.

36 **echo** Th**e cho**sen few gathered around David.

37 **arch** Edith sat in her ced**ar ch**air.

38 **seat** Wait for him plea**se at** the top of the stairs.

39 **idea** The t**ide a**ppears to be receding.

40 **pie, cake** As I cut my birthday cake, I made a wish.

41 **soft, loud** Please turn down your music, it's too loud.

42 **undo, fasten** The pilot told everyone to fasten their seatbelts and prepare for take-off.

43 **radio, television** Dad was watching the six o'clock news on the television.

44 **socks, hands** Please wash your hands before coming to the dinner table.

45 **DKTVJ** To get from the word to the code, move each letter forward two places.

46 **FRIEND** To get from the code to the word, move each letter forward two places.

47–49 To get from the word to the code, move each letter forward four places.

47 **TMGRMG**

48 **LEX**

49 **WIX**

50 **ailment**

51 **scene**

52 **leader**

53 **grate**

54 **nailed**

55–59 When completing this type of question, it is worth remembering that the next letter after Z will be A as the alphabet will start again.

55 **MIRRORS** To get from the code to the word, move the first letter back six places, the second letter back five places, the third letter back four places, the fourth letter back three places, and the fifth letter back two places. The sixth letter stays the same.

56 **HGIZRTSG** This is a mirror code. (C and X, and the two Ls and Os, are clues to this.) We can solve a mirror code with a table like this:

A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N

S = H, T = G, R = I, A = Z, I = R, G = T, H = S, T = G

For a different way of working out mirror codes, the answer to Paper 4 Q57.

57 **STILE** To get from the code to the word, move each letter backwards two places.

58 **JYKPA** To get from the word to the code, move the first, third and fifth letters forward two places and move the second and fourth letters back two places: +2, –2, +2, –2, +2

59 **HEDGE** We can see that each letter has a value the same as its position in the alphabet so A = 1, B = 2, etc. 8 = H, 5 = E, 4 = D, 7 = G, 5 = E

60 **ship** shipwreck, shipmate, shipyard, shipshape

61 **blue** bluebell, blueprint, bluebottle, blueberry

62 **gold** goldfinch, goldfish, goldmine, goldsmith

63 **wheel** wheelbarrow, wheelchair, wheelwright, wheelspin

64 **green** greenfly, greenfield, greengrocer, greenhouse

65–66

	B		E		B
T	R	A	V	E	L
	E		E		A
T	E	N	N	I	S
	Z		T		T
B	E	A	S	T	S

67–68

	I		S		H
U	N	I	Q	U	E
	D		U		A
H	O	N	E	S	T
	O		A		H
B	R	A	K	E	S

69–70

	H		D		T
S	E	V	E	R	E
	A		P		A
A	L	W	A	Y	S
	T		R		E
W	H	I	T	E	R

71 **narrow, wide** 'Narrow' is most opposite to 'wide' because 'narrow' means thin whereas 'wide' means broad.

72 **reward, punishment** 'Reward' is most opposite to 'punishment' because a 'reward' is given for good behaviour whereas a 'punishment' is given for bad behaviour.

73 **blemished, flawless** 'Blemished' is most opposite to 'flawless' because 'blemished' means marked or spoiled, whereas 'flawless' means unmarked or unspoiled (literally, 'without flaws').

74 **free, enslave** 'Free' is most opposite to 'enslave' because to 'free' means to allow someone to live and work as they want, whereas to 'enslave' means to force someone to live and work in a way they do not choose.

75–76 Arrange the words in a grid to make it easier to put them in the correct alphabetical order.

c	u	l	i	n	a	r	y	
c	u	l	t	u	r	e		
c	u	p	b	o	a	r	d	
c	u	r	a	b	l	e		
c	u	s	h	i	o	n		
c	u	s	t	o	m	a	r	y

77–78 Arrange the words in a grid to make it easier to put them in the correct alphabetical order.

p	r	e	c	i	o	u	s	
p	r	e	c	i	p	i	c	e
p	r	e	c	i	s	e		
p	r	e	e	n				
p	r	e	t	t	y			
p	r	e	v	i	o	u	s	

Precious, precipice, precise, preen, pretty, previous are in alphabetical order.

79–80 Arrange the words in a grid to make it easier to put them in the correct alphabetical order.

g	r	a	c	i	o	u	s		
g	r	a	p	e					
g	r	a	p	h					
g	r	a	p	h	i	c			
g	r	a	p	h	o	l	o	g	y
g	r	a	p	p	l	e			

Paper 14 (pages 60–64)

1 **holy** 'Simple' and 'easy' are synonyms in the same way as are 'divine' and 'holy'.

2 **repel** 'Divide' is the opposite of 'multiple' in the same way as 'charm' is the opposite of 'repel'.

3 **apt** 'Summit' and 'top' are synonyms in the same way as are 'suitable' and 'apt'.

4 **site** The last four letters of 'flames' make 'same' in the same way as the last four letters of 'whites' make 'site'.

5 **DEER, DEAR**

6 **BENT, BEND**

7 **PRAM, PRAY**

8 **SLUM, PLUM**

9 **HILT, HINT**

10 **sullen** 'Sullen', 'churlish', 'glowering' and 'sulky' all mean bad-tempered.

11 **sugar** 'Sugar', 'saccharine', 'molasses' and 'muscovado' are all sweeteners.

12 **insect** 'Fly', 'beetle' and 'moth' are all types of 'insect'.

13 **father** 'Father', 'uncle', 'brother' and 'son' are all male relatives.

14 **horse** 'Horse', 'stable', 'hay' and 'saddle' are all found together.

15 **enough** 'Enough', 'sufficient', 'satisfactory' and 'adequate' all mean an appropriate amount.

16 **thin** My dog gave bir**th in** October to five puppies.

17 **tank** His righ**t ank**le was broken when he fell off the wall.

18 **chat** Mary took a crucial cat**ch at** the start of the competition.

19 **wash** Kyle insisted the blue bike **was h**is.

20 **thus** Sukie thought the pa**th us**ually went through the churchyard.

21 **germ** Bruising my fin**ger m**ade me cry.

22 **TV** Each letter in the first pair moves back by four letters in the following pair.

23 **VE** The first letter in each pair moves back by one letter in the following pair. The second letter in each pair moves back by four letters in the following pair.
24 **SV** Each letter in the first pair moves forward by five letters in the following pair.
25 **QJ** The first letter in each pair moves back by three letters in the following pair. The second letter in each pair moves forward by three letters in the following pair.
26 **SF** The first letter in each pair moves back by one letter in the following pair. The second letter in each pair moves forward by three letters in the following pair.
27 **opaque**
28 **light**
29 **hinder**
30 **straight**
31 **sole**
32 **entire**
33 **shapeless**
34 **parrot**
35 **hairstyle**
36 **finally**
37 **restore**
38 **STRANGE**
39 **PLASTER**
40 **SHORTEN**
41 **STRESSED**

42–43

T	I	P
O	R	E
T	E	N

44–45

H	I	S
A	C	E
Y	E	T

46 I **tripped over** the step.
47 When **will** I see you **again**?
48 Granny **knitted** the jumper **for** me.
49 The weather **in** the desert is hot **and** dry.
50 The spider **caught** flies in her **web**.
51 She carried **fresh** flowers in **her** basket.
52 **12** $(6 \times 6) \div 2 = 18$ and $(7 \times 8) \div 2 = 28$, so $(5 \times 12) \div 2 = 30$
53 **3** $13 - 9 - 2 = 2$ and $7 - 4 - 2 = 1$, so $11 - 6 - 2 = 3$
54 **18** $(8 \times 4) \div 2 = 16$ and $(5 \times 20) \div 2 = 50$, so $(6 \times 6) \div 2 = 18$
55 **21** $4 \times 5 \times 3 = 60$ and $2 \times 4 \times 3 = 24$, so $7 \times 1 \times 3 = 21$
56 **25** $13 + 11 - 6 = 18$ and $8 + 12 - 6 = 14$, so $17 + 14 - 6 = 25$

57–61 Use grids as shown below to help work out the missing word.

57 **PRAM**

	2		4		1		3				2		4		1		3	
B	R	I	M		F	O	O	T		T	R	A	M		P	E	A	R

58 **DESK**

			2		3	4		1				2		3	4		1
T	Y	P	E		S	T	O	P		C	A	R	E		S	K	I	D

59 **TINT**

		3	4		1		2				3	4		1		2	
M	I	L	K		S	L	U	M		B	E	N	T		T	H	I	S

60 **REEF**

	3	2	1		4					3	2	1		4			
G	O	O	D		M	O	O	D		B	E	E	R		F	L	A	N

61 **TACT**

3	2		1				4		3	2		1					4
B	U	S	T		B	A	R	S		C	A	R	T		J	U	S	T

62–65 Three of the words, BORE, CARE and ROBE, end in E. Two of the codes end in 1 so E = 1. One code does not end in 1 – 6347 – so this must be the code for CRAB. Therefore C = 6, R = 3, A = 4 and B = 7. CARE = 6431. The two other words are BORE and ROBE; the code 3271 must be ROBE, so O = 2.

A	B	C	E	O	R
4	7	6	1	2	3

3271 = ROBE
6347 = CRAB
6431 = CARE
7231 = BORE

62 **REAR**
63 **BEAR**
64 **7231**
65 **73461**
66 **re** spare, remind
67 **el** parcel, elder
68 **dy** remedy, dyed
69 **on** spoon, once
70 **le** table, lemon
71 **11** $12 \times 2 = 24 = 8 + 5 + 11$
72 **41** $9 \times 3 = 27 = 41 - 14$
73 **3** $9 \times 2 = 18 = 36 \div 3 + 6$
74 **69** $23 + 14 = 37 = 69 - 24 - 8$
75 **16** $72 \div 8 = 9 = 16 - 7$

76–77 When completing this type of question, it is worth remembering that the next letter after Z will be A as the alphabet will start again.

76 **ZMYNC** To get from the word to the code, move the first, third and fifth letters back two places, and move the second and fourth letters forward one place: the sequence is –2, +1, –2, +1, –2

77 **ERROR** To get from the code to the word, move the first, third and fifth letters forward two places and move the second and fourth letters back one place: the sequence is +2, –1, +2, –1, +2 (

78 **N** (A E L **N** P R T)

79 **K** (C E I **K** Q R U)

80 **O** (A F L **O** R V U)

Test 11 — pages 39-41

1. **there** — 'how many days **there** are'
2. **consists** — 'A common year **consists**
3. **whereas** — '**whereas** a leap year'
4. **reason** — 'The **reason** we have'
5. **rotation** — 'the Earth's **rotation**'
6. **longer** — 'fractionally **longer**'
7. **minutes** — '48 **minutes**'
8. **exist** — 'If leap years didn't **exist**'
9. **sound** — '**sound** like much'
10. **calendars** — 'our **calendars**'
11. **approximately** — 'by **approximately**'
12. **makes** — '**makes** up for the time lost'
13. **household**
The other three describe the place where a household lives.
14. **hungry**
The other three are words associated with water.
15. **thin**
The other three describe how smooth an item is.
16. **ladylike**
The other three are words related to a monarchy.
17. **cascade**
The other three describe an upwards movement.
18. colleague
Both words mean 'someone you work with'.
19. resemblance
Both words mean 'likeness'.
20. ransack
Both words mean 'to try to find something'.
21. hostile
Both words mean 'unkind'.
22. dilemma
Both words mean 'difficulty'.
23. **begin**
The words can be rearranged into the sentence 'They had to keep themselves entertained on the long journey.'
24. **banned**
The words can be rearranged into the sentence 'The proposal to ban homework was supported by most pupils
25. **above**
The words can be rearranged into the sentence 'The crane lifted bricks on top of their house'.
26. **perform**
The words can be rearranged into the sentence 'Our school show had a great review in the paper'.

Non-Verbal Reasoning

Test 7 Answers

Section 1 : Matrix

Q1 (a) : upper is top half of lower with colour swap for attached figures

- in lower, free figure at top gets duplicated at the bottom – rule out (b)
- white figures connected by lines become black in lower – only (a) fits
- check the rest of (a) fits the pattern – seems fine

Q2 (b) : right column is a horizontal flip of left

- can see the corners are H-flips of each other & mid top & bottom are V-flips
- expect middle right to be an H-flip of middle left – (b) is the only possibility

Q3 (a) : left is 90° clockwise from right with black going white

- horizontally need 90° clockwise right to left – rule out (b) & (d)
- black figure should turn white – rule out (c)
- compare (a) & (e) – little figure shouldn't flip like (e) so ans = (a)

Q4 (c) : small white inside large grey diamond

- note figures in columns use the same figure
- expect a diamond based figure - rule out (b) & (e)
- figures on left diagonals have the same style
- expect small white inside large grey-rule out (a) & (d) leaving (c)

Q5 (b) : diagonal is an enlarged mouth

- how can a rounded rectangle relate to the left hand figures?
- the lower one has a mouth with that shape
- the upper one has an oval mouth - (b) or (e)
- (e) is the wrong orientation so take (b)

Q6 (a) : top row is the sum of the rows beneath

- 3 symbols can be in any position, no obvious symmetry
- is 1 row or column derived from another?
- top row has the symbols from the rows beneath
- bottom right needs circle and star on right diagonal - (a)

Q7 (e) : figure duplicated & mirrored with black & white ovals added

- horizontal pattern - main figure on right duplicates & H flips
- rule out (c) & (d) - also (a) as it is rotated slightly
- compare (b) & (e) - not (b), no black oval leaving (e)

Q8 (d) : positions of figures from column; type from row

- can see the black shapes are the same across the rows
- unknown will have a star at bottom right - rule out (b) & (c)
- the hexagon position comes from column - will be top right
- rule out (a) and (e) (octagon) leaving answer = (d)

Q9 (a) : left to right flip horizontally & colour reverse

- left to right is a horizontal flip of everything with colour reverse
- all have white figures so not helpful
- look for a flipped F - rule out (b) & (c)
- sketch a flip of the line figures - not (d) (triangle & square reversed)
- compare (a) & (e) - triangle is wrong in (e) so answer = (a)

Q10 (c) : central figures increase or decrease by 1, corners symmetrical

- main figures go up or down by 1 - 3 arrows - rule out (d)
- corner figures are symmetrical - black star top right - not (e)
- that's it so compare (a) (b) (c) - (a) is wrong way up
- (b) is short of 1 arrow head so answer = (c)

Q11 (b) : black part of left turns white; downwards, outer circle added with lower right sector missing

- need an outer circle with lower right missing - rule out (d)
- inside – is it black bit turns white or circle changes colour?
- if it's circle changes colour then we need all black which is (a)
- is (a) OK? – no, not enough points on the star
- if it's black becomes white then it's all white – rule out (a) & (e)
- compare (b) & (c) – star should be on the right so answer = (b)

{try to be open to different ways of looking at a question}

Q12 (e) : figures all the same on right diagonals

- pattern on right diagonals - all the same
- look for something like lower middle - not (a) or (d)
- compare (b) (c) (e) - should be exactly like lower middle = (e)

Q13 (a) : upwards, arrow line shortens, cross and oval separate

- upper figure will move up - cross will separate from oval
- need cross at the top, oval at bottom - rule out (c) & (b) (wrong cross)
- arrow line just shortens - not (d) or (e) (wrong end / wrong way)
- only leaves (a) - looks good so answer = (a)

Q14 (a) : dots same on right diagonals = 4, other figure position from right diagonal, style from row

- number of dots increases by one along the row – need 4, rule out (c)
- style of other figure from row – need + in a circle – rule out (d)
- position of other figure same on right diagonals – need bottom left = (a)

Q15 (b) : diagonally, rotated 180° with circle & line added

- matrix is diagonal - line figure is 180° rotated - not (a) or (d)
- end turns white - all OK
- black circle and bar added with bar at free end so not (e)
- compare (b) & (c) - (c) has arrow head so answer = (b)

Q16 (d) : figures on right diagonals are the same

- not 3 of each & can't see any relationship between different figures
- check out the diagonals - right diagonals all the same
- rules out (a) (c) & (e)
- compare (b) & (d) - white circle in (b) leaving (d)

Section 2 : Analogies

Q1 (c) : shading from top appears in centre, lower gives outer shading

- clearly 2 figures on left give combined figure on right but which way?
- shading of the lower could rotate with the figure & become the inner
- if so (a) is the only one but it's bold so cannot be right – rule out (a)
- inner shading must come from upper so we need grey inner figure
- (b) is wrong orientation, (d) is too fat and (e) is dashed so answer = (c)

{always be aware that line shading may or may not rotate with the figure}

Q2 (e) : lower shading rotated 45° anti-clockwise, upper white, same connector

- two copies of the original shape are attached by a line.
- shading has rotated 45° anti-clockwise at bottom – rules out (b) (c) & (d)
- compare (a) & (e) – connectors are different, (a) is wrong so answer = (e)

Q3 (c) : outer is a V-flip of original with a small black copy of original inside

- outer figure is a V-flip of the original - rule out (a)
- inner is a small black duplicate of original - rule out (d) & (e)
- compare (b) & (c) - inner black arrow is wrong in (b) leaving (c)

Q4 (c): figure rotates 90° and vertical straight lines elongate and go dotted

- figure has rotated 90° (can't say which way) - rule out (e)
- the straight connecting lines have elongated and gone dotty - rule out (d)
- (b) is hopeless so compare (a) and (c)
- upper black symbols have changed in (a) so answer = (c)

Q5 (e) : figures swap outline and front figure becomes back & fatter

- no flips or rotations - rule out (b)
- small figure gets fatter – rule out (d)
- outline style swaps - look for solid small oval, dashed large oval - all OK
- figure that was behind is now in front - look for big oval on top
- only (e) has this - check (e), looks good – answer = (e)

Q6 (d) : lower shapes added to upper, no other change

- shapes on bottom row are added to the shapes on top
- look for white circle in square at left – only (d) works
- check it has white triangle in triangle – good, so answer = (d)

Q7 (b) : 1st small figure has same shading, 2nd is 90° , 3rd vertical

- 3 copies of original shape – all have this
- left should be same as 1st – rule out (a) (d) & (e)
- compare (b) & (c) –mid should be right-shaded so answer = (b)

Q8 (e) : star gets less spiky; number of points determines number of dots

- star changes shape but number of points and orientation not changed
- look for fat 3 point star – all are but (c) is upside down
- upper face replaced by black dots - number = number of points on star
- look for a triangle of black dots – rule out (a) & (d)
- compare (b) & (e) – dividing line should be dashed so answer = (e)

Q9 (a) : outer gets slimmer, inner divides in 2 and vertical centre line appears behind

- looks like the outer gets squashed horizontally - they all have
- inner divides into 2 - look for 2 circles - rule out (b)
- vertical solid dividing line appears behind squares - rule out (d) & (e)
- compare (a) & (c) - (c) has sharp corners so rule it out & take (a)

Q10 (e) : number of sides of first figure determine number of small copies in second

- hexagon gives 6 little hexagons in an oval (number of sides)
- look for 4 diamonds in an oval - rule out (c) and (d)
- hexagons are same orientation as original and at vertices of 1st figure
- not (a) (not at edge of oval) - not (b) (rotated) so answer = (e)

Q11 (a) : uses figures from 3rd figure in same way as 2nd is made from 1st

- all the figures in the 2nd have come from the 1st
- 2nd figure has 4 black hearts at centre – look for 4 B's – only (a) has this
- check that the P's are where the stars are in the 2nd - yes
- O's and D's also look good so answer = (a)

Q12 (c) : stars on horizontal rotate 45° , symbols on circle duplicate

- lines have doubled, so should dots - rule out (a)
- squares on horizontals became diamonds - stars should rotate - rule out (b)
- vertical squares didn't change - rule out (e)
- compare (c) & (d) - middle shouldn't change - rule out (d) leaving (c)

Q13 (d) shape rotates 45°; inner shadings swap

- shape rotates 45° (could be either way) – rule out (a) & (c) is too small
- outer remains white – rule out (e)
- compare (b) & (d) – outline wrong in (b) so answer = (d)

Q14 (c) : V-stripes to H-stripes; left diagonal to right; black to V-stripes & white to black

- looks like swap of shading - not going to be able to tell what grey will become
- take them in turn - vertical stripes become horizontal - rule out (d)
- left diagonals become right - rule out (e)
- black becomes V-shading – rule out (a) leaving (b) & (c)
- compare (b) & (c) – centre comes from white so should be black - take (c)

Q15 (d) : outer shapes swap outlines; inner figure goes black and rotates 45° clockwise

- centre figure turns black and rotates 45° clockwise - rule out (a) & (e)
- outer figures swap outlines - look for dotted outer - rule out (b)
- compare (c) & (d) - hexagon should be dashed so answer = (d)

Q16 (c) : inverts, gets black eyes, grumpy mouth, neck & black hair

- face inverts & eyes go black - rule out (b)
- smile becomes grumpy - rule out (a)
- gets hair and neck - rule out (e)
- compare (c) & (d) - (d) has white hair, (c) is OK

Section 3 : Codes

Q1 (e) : OL : 1st is orientation; 2nd is inner figure

- all different 1st letters so leave for now
- 2 L's as 2nd letter goes with inner– unknown is similar so 2nd letter = L
- all differ in orientation of outer – unknown points right so 1st letter is O
- answer = OL = (e)

Q2 (c) : CE : 1st is shading at top; 2nd is pattern of the shapes inside

- 2 N's as 1st letter goes with white at top - unknown is black so 1st letter is C
- all different for 2nd – pattern of shapes – unknown like middle so 2nd letter is E
- answer = CE = (c)

Q3 (e) : PZ : 1st is symbol on lines; 2nd is orientation of lines
- all different on 1st so do 2nd - 2 J's top and bottom go with angle of lines
- unknown has parallel lines like middle so 2nd letter is Z
- what is different in each - symbols at ends of lines
- unknown has black circles like top so 1st letter is P - answer is PZ = (e)

Q4 (d) : TQV : 1st is letters; 2nd is star; 3rd is centre shading
- 2 P's as 1st letter goes with letters; unknown is HOT so 1st letter is T
- 2 M's as 2nd letter goes with star; unknown is 8 so 2nd letter is Q
- 2 W's as 3rd letter goes with centre colour; unknown is white so 3rd letter is V
- answer = TQV = (d)

Q5 (c) : UA : 1st is points on star; 2nd is circle in centre of star
- 1st letters all different so leave for now
- 2 A's as 2nd letter goes with centre circle; unknown has one so 2nd letter is A
- all differ in outer shape – if this is 1st letter answer will be UA
- UA is an option so answer = UA = (c)

Q6 (d) : GT : 1st is orientation of spiral; 2nd is shading
- 2 L's as 1st letter goes with orientation of spiral – unknown is a new letter
- 3 A's as 2nd letter goes with shading – unknown is white so 2nd letter is T
- answer = (new)-T = GT = (d)

Q7 (e) : CR : 1st is orientation of circles; 2nd is number of circles
- 2 P's as 1st letter could be shading or orientation - can't tell so deal with 2nd
- 2 U's as 2nd letter goes with number of circles – unknown is 2 so 2nd letter is R
- if 1st letter is shading then we want PR - not an option
- if 1st letter is orientation - unknown is vertical so 1st letter is C
- answer = CR = (e)

Q8 (a) : WD : 1st is inner shading; 2nd is outer shading
- 2 W's & 2 T's as 1st letter goes with inner triangle shading
- unknown is black so 1st letter is W
- 2 P's as 2nd letter goes with outer shading – unknown is V-shade so 2nd letter is D
- answer = WD = (a)

Q9 (b) : DAG : 1st is position of face; 2nd is presence of white; 3rd is presence of vertical shading
- no similarities in the first letters so move onto second
- 2 A's as 2nd letter goes with having a white – unknown has so 2nd letter is A
- 2 G's as 3rd letter goes with having V-shade – unknown has so 3rd letter is G
- all differ in smiley position so 1st letter is D
- answer = DAG = (b)

Q10 (a) : IEL : 1st is star points; 2nd is circle shading; 3rd is squiggles
- no similarities in the first letters so move onto second
- 2 E's as 2nd letter goes with black circle – unknown has so 2nd letter is E
- 2 L's as 3rd letter goes with squiggles – unknown is similar so 3rd letter is L
- 1st letter must be star – unknown is 3 points so 1st letter is I
- answer = IEL = (a)

Q11 (b) : SED : 1st is outer shape; 2nd is inner shading; 3rd is inner shape
- no similarities in the first letters so move onto second
- 2U's as 2nd letter goes with inner shading – unknown is white so 2nd letter is E
- 2 P's as 3rd letter goes with inner shape – unknown is circle so 3rd letter is D
- 1st letter must be outer shape – we need pentagon so 1st letter is S
- answer = SED = (b)

Q12 (e) : JH : 1st is missing spot; 2nd is centre shading (outer not coded)
- all different on 1st letters so do 2nd letters first
- 2H's as 2nd letter goes with black centre – unknown is black so 2nd letter is H
- all differ in which black spot is missing - unknown is different again so new letter
- answer = (new)-H = JH = (e)

Q13 (d) : GB : 1st is lower shape + shading; 2nd is number of crosses
- all different on 1st letters so do 2nd letters first
- 2 B's as 2nd letter goes with number of +, unknown has 3 so 2nd letter is B
- all differ in shape plus colour of lower shape – unknown is black heart so 1st letter is G
- answer = GB = (d)

{Unusual – 1st letter is 2 features of lower shape taken together}

Q14 (c) : AN : 1st is position of horizontal oval; 2nd is vertical oval position
- 2 C's as 1st letter goes with height of horizontal oval
- unknown is near top so 1st letter is A
- 2 L's as 2nd letter goes with position of vertical oval
- unknown is at right so 2nd letter is N
- answer = AN = (c)

Q15 (a) : BN : 1st is shading; 2nd is number of circles
- all different on 1st letters so do 2nd letters first
- 2 T's as 2nd letter goes with circle number– unknown has 4 so 2nd letter is N
- all differ in triangle shading – unknown is black so 1st letter is B
- answer = BN = (a)

Q16 (b) : GL : ambiguous; 1st is shading; 2nd is shape (no EP option)
- help, no pairs - obviously about shape and shading
- if 1st is shape (we need E) & 2nd is shading (we need P) so answer is EP
- there isn't an EP answer given so it must be the other way round
- if 1st = shading (we need G) & 2nd = shape (we need L) so answer is GL
- GL is an option so this must be right; answer = GL = (b)

{if you can't tell which letter is which, try both ways & look at the answers}

Section 4 : Series

Q1 (b) : white shape, 6 left diagonals, horizontal touching tear drop
- tear drop alternates black / white - rule out (d)
- lines increase by 1 - need 6, rule out (c)
- horizontal line is dropping - rule out (a)
- compare (b) & (e) - lines wrong way in (e) leaving (b)

Q2 (d) : free lines increase / decrease by one; lines in triangle decrease by one

- top lines increase by 1 – we need 3 – rule out (a)
- bottom lines decrease by 1 – we need 3 – rule out (c) (on the right)
- lines in triangle decrease by 1 – we need 2 – rule out (b) & (e) leaving (d)

Q3 (a) : alternate diagonals gain a circle at each end, alternating shading

- get 2 more symbols each time – need 5 – rule out (d)
- symbols added alternately to each diagonal – rule out (c)
- shadings next to centre should be 'x' – rule out (b) & (e) leaving (a)

Q4 (d) : black circle moves from bottom right to top left, arrow alternates position

- lose a circle from bottom right giving 3 - all OK but (c) has a white one
- gain a circle at top left giving 1 - rule out (b)
- arrow alternates position - top right - rule out (e)
- compare (a) and (d) - (a) has wrong arrow type leaving (d)

Q5 (c) : black point shows where black ball will be, black ball turns white afterwards

- look at the 1st three; black star point moves around randomly
- black point shows where the black ball will be next
- points to upper left in (3) so look for black ball in upper left - rule out (a)
- black ball in (5) is lower left - look for black point in lower left - rule out (b) (e)
- compare (c) & (d) – (d) has lost the top ball & gained one lower left
- (c) looks good so answer = (c)

Q6 (e) : pentagon moves clockwise, bottom figures flip; top, 3 left 1 right

- look at pentagon moving clockwise round corners - bottom left so rule out (a)
- look at lower group - points right then left so need left pointing - rule out (c)
- look at top 4 triangles - missing triangle should be at position 4 - rule out (b)
- compare (d) & (e) - (d) is actually a heptagon so take (e)

Q7 (b) : rotates 45° anti-clockwise, style alternates; lose an arrow head

- cross rotates 45° anti-clockwise – rule out (a)
- arrow heads alternate – should point out – rule out (d)
- number of arrow heads reduces – need 2 – rule out (c)
- compare (b) & (e) – triangle should point right so answer = (b)

Q8 (b) : centres go in sequence; 1 pair of rays lost each time

- sequence of centres – double circles follow white – rule out (c) & (e)
- 1 pair of rays lost each time – need 3 pairs – rule out (d)
- compare (a) & (b) – missing line will be horizontal or vertical so answer = (b)

Q9 (c) : circle moves anti-clockwise round the star; insect moves 1 side clockwise (head first); corners alternate and black moves anti-clockwise

- white circle is moving clockwise round the star - should be top so rule out (b)
- insect is moving clockwise by 1 side - all in same place but (d) is backwards
- look at the corners - black corner moves anti-clockwise - (a) has 2 so rule out
- compare (c) & (e) – diamonds & triangles alternate so answer = (c)

Q10 (b) : shading rotates 45° anti-clockwise; arrow alternates; back wheel will be black

- arrows look easy - alternating so forward at the bottom - rule out (a) and (d)
- shading - rotates 45° anti-clockwise so will be vertical next - rule out (c)
- compare (b) & (e) - shading not right in (e) so answer = (b)
- didn't need the wheels - black at front then back then neither - back follows front

Q11 (c) : main figure flips vertically; small figure alternates & moves anti-clockwise

- main figure - (1) (3) & (5) are the same so looks like its alternating so will look like (2)
- rule out (d) & (e) (shapes are actually flipped vertically)
- other figure moves anti-clockwise round the corners - should be top left so rule out (a)
- compare (b) & (c) - need white diamond so answer = (c)

Q12 (a) : inner dots increase by one; outer black dot moves clockwise & white moves anti-clockwise

- centre black dots increase by 1 – need none in 1st so rule out (c) & (d)
- black dot moves clockwise – should be bottom left – rule out (b) & (e)
- leaves only (a) – white circle moves anti-clockwise so also bottom left
- answer = (a) – the black dot is on top of the white circle

{could (b) be right with the black dot hidden by the white circle? The rule is that black hides white not the other way round so only take (b) if there is no better option}

Q13 (e) : symbols appear at left and rotate anti-clockwise till (e) when one is lost

- central dot is constant – rule out (b)
- follow the 3 lines - they move anti-clockwise to 4th then are lost in 5th
- 3rd should have the 3 lines at right - rule out (c)
- same with the oval - should be bottom - rule out (a)
- compare (d) and (e) – diamond should be on left so answer = (e)

Q14 (d) : all anti-clockwise; black by 2 places; vertical shade and small by 1 place

- try the black - moves anti-clockwise 2 places - should be top left - rule out (b)
- now the shaded one - anti-clockwise 1 place - should be top right - (a) is horizontal
- and the little one - anti-clockwise 1 place - should be top left with black - rule out (c)
- compare (d) & (e) - only 6 balls in (e) so answer = (d)

Q15 (d) : triangle moves anti-clockwise, dot moves clockwise, main shape loses arms

- look at main shape - lose an arm clockwise so should have none - rule out (c)
- look at dot - moves clockwise so should be bottom - rule out (e)
- look at triangle - moves anti-clockwise so should be bottom left - rule out (b)
- compare (a) & (d) - (a) has sharp corners so take (d)

Q16 (a) : alternating pattern (1-3-5) , lower element H-flips
- note 2nd = 4th so this is an alternating series (1) (3) (5) - rule out (c)
- no logic to top element but bottom element H-flips
- lower should flip again and look like (1) - rule out (b) & (d)
- compare (a) & (e) - lines on top in (e) so take (a)

Section 5 : Belongs with

Q1 (c) : 3 overlapping unfilled circles of different sizes
- 3 unfilled circles, same 3 sizes – rule out (d) & (e)
- circles overlap on same layer – rule out (a) & (b) leaving answer = (c)

Q2 (b) : circle, square & 5 point star on a triangle
- circle square & 5 point star on a triangle – rule out (a) & (d)
- all on same layer, nothing hidden – rule out (e)
- compare (b) & (c) – square not overlapping in (c) so answer = (b)

Q3 (e) : black shape is one of the corner shapes
- irregular polygons with line cutting off a corner - all are like this
- single black shape free within the polygon - rule out (a) (b) & (d)
- compare (c) & (e): black shape is a version of corner so answer = (e)

Q4 (d) : polygon with dotted symmetry line - white circles inside at ends
- dotted line divides figure into symmetrical halves - not (a) or (e)
- both figures are polygons so (b) is out
- compare (c) & (d) - must be about the black & white circles
- should be black at corners away from dividing line - answer= (d)

Q5 (c) : rectangle with overlapping heart triangle & square clockwise
- rectangle has triangle, heart & square overlapping – rule out (d)
- point of triangle is inside rectangle – rule out (b)
- square is parallel to rectangle – rule out (a) & compare (c) & (e)
- clockwise heart triangle square – rule out (e), answer = (c)

Q6 (a) : 2 circles on same layer on adjacent points, black triangle inside
- 4 points of a 5 point star – all OK
- white circles overlap on 2 points – rule out (b) & (e)
- circles should be on adjacent points – rule out (c)
- compare (a) & (d) – 1 of the circles hides a point in (d) so answer = (a)

Q7 (b) : square with 2 black shapes & 2 whites, black & white are different
- square has 2 pairs of identical symbols overlapping – rule out (a) & (d)
- 2 of the symbols are black – rule out (e)
- compare (b) & (c) – black & white symbols should differ – answer = (b)

Q8 (b) : outer is semi-circle + 2 straight sides; inner indicates number 5
- inner shapes both indicate 5 (5 points, 5 circles) - rule out (c) (4 circles)
- outer is a semicircle and 2 straight sides - not (e) (3 straight) or (a) (not joined)
- compare (b) & (d) – black inners & not semicircle in (d) so answer = (b)

Q9 (e) : rectangle with cross & white shape overlaps rectangle with black square
- there's a cross at the top – rule out (b) & (c)
- little rectangle with a black square overlaps 1 side – rule out (d)
- compare (a) & (e) – other figure should be white so answer = (e)

Q10 (e) : upper is copy of lower but rotated 90° anti-clockwise
- looks like 2 copies of a figure - upper is rotated 90° anti-clockwise
- obviously not (b) (dashed) or (c) (same layer)
- try (a) - no, top is clockwise - try (d) - no top is flipped as well as rotated
- leaves (e) - looks good so answer - (e)

Q11 (b) : heart contains 3 straight lines of different length + 2 lines at base
- heart has 2 curved lines at base- rule out (c) & (e)
- inside are 3 straight lines – rule out (a)
- compare (b) & (d) – lines should be different lengths so answer = (b)

Q12 (e) : outer figure bold and symmetrical; inner has right arrow and 1 other shape
- outer figure should be bold so rule out (c)
- 2 inner figures (not (b)) one of which is a right arrow - (a) has left arrow
- compare (d) & (e) - wrong sort of arrow in (d) so answer = (e)

Q13 (e) : figures have an order of rotational symmetry of 4
- vertical and horizontal lines of symmetry? – rule out (a) & (d)
- compare the rest –seem fine for shading, outline and everything else
- on the left you can rotate 90° and it still looks the same – rotational symmetry
- (e) has rotational symmetry so answer = (e)

{rotational symmetry is unusual in this type of test but it could come up}

Q14 (b) : outer shape with 1 dashed side contains '+', 'x' & 2 identical white shapes
- outer shapes have 1 dashed side rule out (e)
- dashed side should be straight so rule out (c)
- inners are 2 identical, '+' and 'x' – rule out (d)
- compare (a) & (b) – identical shapes should be white so answer = (b)

Q15 (d) : rounded square with white triangle & figure overlapping flipped copy of itself
- outer is rounded square - rule out (a)
- contains triangle - rule out (b) (no triangle)
- contains figure overlapping a flipped copy of itself - (c) has 1 figure on top
- compare (d) & (e)-overlap in (e) not symmetrical so answer= (d)

Q16 (b) : symbols inside 1 more than sides of polygon
- 2 polygons with symbols inside - rule out (a) & (d) (not polygons)
- rule out (e) as one of the symbols not inside the polygon
- original figures - 4 symbols in a triangle & 6 in a pentagon - always 1 more
- (c) has 6 ovals in a hexagon, (b) has 4 stars in a pentagon so answer = (b)

Quick Lesson Recap

1) Simplify the ratio of 60:75 =

4:5

2) Write 999 in Roman Numerals

CMXCIX

3) Three car journeys take, 4 minutes, 8 minutes and 6 minutes. Workout the mean time taken for the three journeys ?

6 Minutes

4) A box has a length of 10m, a height of 6m and a depth of 0.5m. Workout the volume.

$30m^2$

5) There are 240 sweets in a box. 20% are orange, $\frac{3}{8}$ are red. The remaining are blue. How many sweets are orange and blue combined?

150

6) Workout 45% of 300 =

135

7) Workout 75% of 470 =

352.5

8) What is $\frac{3}{5}$ of 1200ml ?

720

9) What is $\frac{4}{9}$ of 4032g ?

1792

Homework – Vocabulary to memorise

Vocabulary 7

Exercise A

1. Dispense
2. Crisis
3. Stray
4. Avert
5. Panel
6. Accessory
7. Authentic
8. Prominent
9. Implore
10. Cedar

Exercise B

1. Authentic
2. Crisis
3. Implore
4. Stray
5. Avert
6. Cedar
7. Accessory
8. Panel
9. Dispense
10. Prominent

Anagrams

Test 7

1.	f	The flute is a member of the woodwind family.
2.	o	A good sense of humour is an attractive quality.
3.	t	The toddler had a tantrum in the shop.
4.	k	I took the knife out of the drawer.
5.	p	Lack of sleep can make you feel grumpy.
6.	g	Being a tree surgeon can be dangerous.
7.	n	My mobile phone contract ends next month.
8.	w	The bad weather will not stop me going for a walk.
9.	u	She snuggled under her duvet.
10.	w	The view from the tower is amazing today.

Related Words

Test 7

1 digits

Solution: The words in the top row of the grid are all structures used to organise written symbols to convey ideas. The words directly below are the individual components of these structures (e.g. 'digits' make up 'numbers').

2 vision

Solution: The words in the top row of the grid are all homophones. Each word in the bottom row is a synonym of the word directly above (e.g. 'sight' and 'vision' are synonyms).

3 empress

Solution: The words in the top row of the grid are all areas that can be ruled by a single leader. Each word in the bottom row is a type of ruler who can preside over the area directly above (e.g. an 'empress' rules an 'empire').

4 relaxed

Solution: The words in the top row of the grid all end in 'ful'. Each word in the bottom row is an antonym of the word directly above (e.g. 'relaxed' and 'fretful' are antonyms).

5 spread

Solution: The words in the top row of the grid are all anagrams of the words directly below them (e.g. 'drapes' is an anagram of 'spread').

6 zero

Solution: The words in the top row of the grid are all types of triangle. Each words in the bottom row gives the number of equal sides in the triangles directly above (e.g. a 'scalene' triangle has 'zero' equal sides).

7 apple

Solution: Each word in the top row of the grid can be used with the word directly below to name a type of sweet treat (e.g. 'toffee apple').

8 beat

Solution: Each word in the top row of the grid can be joined to the word directly below to form a new word that relates to the body (e.g. 'heartbeat').

9 peer

Solution: All of the words in the top row of the grid are synonyms of 'new', but these words can have alternative meanings. Each word in the bottom row is a synonym of the word directly above and gives an alternative meaning (e.g. 'peer' is a synonym of 'contemporary' when it is used to mean 'new') .

10 quaint

Solution: The last three letters of 'ventricle' form the first three letters of 'clever'. The last three letters of 'clever' form the first three letters of 'versatile'. The words in the bottom row follow the same pattern as those in the top row.

Rhyming Synonyms

Test 7

1. **A** **spread**
   reverse → disperse → spread
2. **D** **shepherd**
   lied → guide → shepherd
3. **D** **instruct**
   chief → brief → instruct
4. **E** **opaque**
   rowdy → cloudy → opaque
5. **D** **tube**
   python → siphon → tube
6. **D** **provoke**
   haunt → taunt → provoke
7. **E** **exploit**
   refuse → abuse → exploit
8. **E** **productive**
   specific → prolific → productive
9. **A** **extreme**
   pretence → intense → extreme
10. **A** **self-important**
    compass → pompous → self-important