Numeracy Professional Skills
Practice Test 2 - Answers

Mark Scheme

Mental Arithmetic Section

Question Number	Correct Answer (1 mark)	Also Accept (1 mark)	Do Not Accept (0 marks)
1	$\dfrac{2}{5}$	$\dfrac{02}{05}$	
2	$15:35$		$3:35$
3	5.26		
4	40.50	40.5	40.500
5	450	450.0	
6	60 or 60.00	60.0	60.000
7	55.25		
8	66	66.0	
9	0.6	0.60	
10	195	195.0	
11	70	70.0	
12	30	30.0	

Written Data and Arithmetic Section

Question Number	Test Section	Correct Answer (1 mark)	Also Accept (1 mark)	Do Not Accept (0 marks)
13	WD	Options A and B		
14	WD	9	9.0	
15	WD	6	6.0	
16	WA	11 hours and 45 minutes		11 hours and 75 minutes
17	WA	9.60	9.6	9.600
18	WD	2011: 62 2012: 67		
19	WA	Pupil B		
20	WD	Options A and C		
21	WA	220	220.0	
22	WD	Classes $4c$ and $6a$		
23	WA	0.3		0.30 0.333 $0.\dot{3}$
24	WA	1925 plain flour, 30.25 teaspoons ground ginger, 8.25 teaspoons ground cinnamon		
25	WA	Options B and C		
26	WA	$9:50$		$9:30$ $9:5$
27	WA	58860.02		58860.020
28	WA	Pupil A: 51 Pupil B: 53		

Guidance for Answering the Questions

Mental Arithmetic Questions

Question 1

The number of pupils in a class is 20.

The number of pupils who got grade A is 8.

The fraction of pupils who got grade A is $\frac{2}{5}$.

Further help

8 out of 20 is equivalent to: 2 out of 5, which as a fraction is $\frac{2}{5}$.

Question 2

Pupils left school at $9{:}15$.

The journey one way to Bath takes 1 hour and 40 minutes.

The journey from Bath to school also takes 1 hour and 40 minutes, so the total journey time is 2 hours and 80 minutes, which is the same as 3 hours and 20 minutes.

Pupils spent 3 hours in Bath.

Pupils were out of school for 6 hours and 20 minutes.

Pupils returned to school at $15{:}35$.

Question 3

Zero point zero one is 0.01 written as a decimal.

Multiplying by 0.01 is the same as dividing by 100.

$526 \times 0.01 = 526 \div 100 = 5.26$

Question 4

The number of slices of cake sold is 15.

The price of one slice of cake is £1.50.

The amount of money collected from the sale of cake is $15 \times £1.50 = £22.50$.

The number of biscuits sold is 18.

The price of one biscuit is £1.00.

The amount of money collected from the sale of cake is $18 \times £1.00 = £18.00$.

The total amount of money collected for the charity is $£22.50 + £18.00 = £40.50$.

Question 5

The number of classes in a primary school is 18.

The average number of pupils in each class is 25.

The number of pupils in the school is: $18 \times 25 = 450$.

Further help

To multiply 18 by 25 first think of 18 as $10 + 8$ and multiply both by 25:

$10 \times 25 = 250$

$8 \times 25 = 200$.

Then add these two results to get the final answer: $250 + 200 = 450$.

Question 6

The amount of pocket money John got is £50.00.

£1.00 = 1.20 euros

£50.00 is worth $50.00 \times 1.20 = 60.00$ euros.

Further help

First note that 50.00 is equivalent to 50 and that 1.20 is equivalent to 1.2. To multiply 50 by 1.2 rewrite 50 as 10×5 and multiply that by 1.2. When multiplying the order of numbers does not matter, therefore, $10 \times 5 \times 1.2 = 1.2 \times 10 \times 5 = 12 \times 5 = 60$.

Question 7

The length and width of a classroom are $8.5m$ and $6.5m$.

The area of a rectangle is calculated by multiplying length by width: $8.5m \times 6.5m = 55.25m^2$.

Further help

One method to solve the multiplication is by breaking down the second number into easier numbers: $(8.5 \times 6) + (8.5 \times 0.5) = 51 + 4.25 = 55.25$.

Question 8

The number of points pupil scored in the mock GCSE exam is 55.

Pupil's score increased by 20% at the actual GCSE exam.

20% is equivalent to $\frac{1}{5}$. $\frac{1}{5}$ of 55 is 11.

Pupil got $55 + 11 = 66$ points in the actual GCSE exam.

Question 9

The number of pupils in a year group is 120.

The number of pupils who do not like maths is 48.

The number of pupils who like maths is $120 - 48 = 72$.

The proportion of the year group that likes maths: 72 out of 120 is equivalent to 3 out of 5, whis as a decimal is 0.6.

Further help

To simplify a fraction/proportion, look for a number that divides both numbers (the numerator and the denominator).

In the example, both 72 and 120 can be divided by 24 (or in stages by for example 2, 2, 2, 3 or by 4, 6) giving 3 and 5 respectively (i.e. the proportion 3 out of 5).

Question 10

The distance cycled is 312 kilometres.

8 kilometres is approximately 5 miles.

$8 \times 40 = 320$ kilometres is approximately $5 \times 40 = 200$ miles.

312 is: $320 - 8$.

So, 312 kilometres is approximately $200 - 5 = 195$ miles.

Alternative method:

312 divided by 8 equals 39.

39 multiplied by 5 equals 195.

Question 11

The number of pupils in a year group is 150.

The number of pupils achieving grade A or B is 70% of $150 = 105$.

The number of pupils achieving grade A is 35.

The number of pupils achieving grade B is $105 - 35 = 70$.

Further help

70% is equivalent to $\frac{7}{10}$.

$\frac{7}{10}$ of $150 = 7 \times 15 = 105$

The number achieving grade A is stated in the question.

The number achieving grade B is calculated by subtracting the number achieving grade A from the number achieving grade A or B.

Question 12

The number of classes in a school is 18.

The number of pupils in a school is 540.

The average number of pupils in each class is $540 \div 18 = 30$.

Written Questions

Question 13

Statement 1: The range of marks was wider for the Maths test than for the English test.

Maximum Maths test mark is 40.

Minimum Maths test mark is 3.

The range of marks for the Maths test is $40 - 3 = 37$.

Maximum English test mark is 38.

Minimum English test mark is 5.

The range of marks for the English test is $38 - 5 = 33$.

The range of marks was wider for the Maths test than for the English test.

Statement 1 is True.

Statement 2: Exactly 50% of pupils did better in English than they did in Maths.

The number of pupils who did better in English than they did in Maths is 13.

The number of pupils who took both tests is 26.

13 out of 26 is a half, i.e. 50%.

Statement 2 is True.

Statement 3: 13 pupils scored less than 25 marks on the Maths test.

The number of pupils scoring less than 25 marks on the Maths test is 12.

Statement 3 is False.

Further help

Statement 1: Range is the difference between maximum and minimum value in the data set. Marks for the Maths test are on the horizontal axis while for English on the vertical axis. To find the maximum and minimum marks for Maths test, find the most right and most left points (respectively) and read their coordinates on the horizontal axis. To find the maximum and minimum marks for English test, find the highest and lowest points (respectively) on the graph and read their coordinates on the vertical axis.

Statement 2: First you need to identify the area on the graph where marks for Maths and English tests are the same. This is the diagonal line passing through points $(0, 0)$ and $(40, 40)$. The points above the line represent pupils who scored more marks in English test than they did in Maths.

Statement 3: First imagine a vertical line going up from the mark of 25 on the horizontal axis. All the points to the left from that line represent pupils who scored less than 25 marks on the Maths test.

Question 14

Subject	Percentage point difference
Maths	5
English	7
Humanities	2
Foreign Language	9
Physics	1
Chemistry	1
Biology	3
PE	4
IT	2

The highest percentage point difference is 9% (Foreign Language).

Question 15

The number of pupils in School A is 116.

The percentage of pupils in School A who like Maths best is 9%.

The number of pupils in School A who like Maths best is 9% of $116 = 10.44 = 10$ (rounded to the nearest whole number).

The number of pupils in School B is 114.

The percentage of pupils in School B who like Maths best is 14%.

The number of pupils in School B who like Maths best is 14% of 114 $= 15.96 = 16$ (rounded to the nearest whole number).

The number of pupils who like Maths best in School B is greater by 6 in comparison to School A.

Further help

To calculate a percentage of an amount on a calculator:

Method 1: multiply the two numbers together and then divide by 100. e.g. 9% of 116 $= 9 \times 116 \div 100 = 10.44$.

Method 2: convert percentage to decimal and multiply it by the number of pupils in the school: e.g. 9% of 116 $= 0.09 \times 116 = 10.44$.

Question 16

The total time spent on reading is

$3.5 + 2.2 + 0.65 + 1.3 + 4.1 = 11.75$ hours $= 11$ hours and 45 minutes.

Further help

11.75 hours is equivalent to 11 and $\frac{3}{4}$ (three quarters) of an hour.

$\frac{3}{4}$ of an hour is 45 minutes.

Question 17

The amount of money allowed per pupil is £80.00.

The exchange rate at the airport in the UK is £1 $= 4.80PLN$.

Exchanging £80.00 in the UK each pupil would get $80.00 \times 4.80 = 384.00PLN$.

The exchange rate in Poland is higher by 2.5% compared to the rate in the UK, which in Polish money is $0.12PLN$.

The exchange rate in Poland is $4.92PLN$.

Exchanging £80.00 in Poland, each pupil would get $80.00 \times 4.92 = 393.60PLN$.

Exchanging money in Poland, each pupil gets $393.60 - 384.00 = 9.60PLN$ more than they would get in the UK.

Further help

To calculate 2.5% of $4.80PLN$ you can use one of two methods:

Method 1: multiply the two numbers together and then divide by 100. e.g. 2.5% of 4.80 $= 2.5 \times 4.80 \div 100 = 0.12$.

Method 2: convert percentage to decimal and multiply it by the exchange rate in the UK: 2.5% of 4.80 = $0.025 \times 4.80 = 0.12$.

The question could also be solved using a single calculation $0.025 \times 4.80 \times 80.00 = 9.60$.

Question 18

The number of pupils achieving A* - C in 2010 was 66.

The number of pupils achieving A* - C in 2011 decreased by 6% when compared with the previous year.

Therefore, the number of pupils in 2011 was equal to 94% = 0.94 of the number of pupils in 2010: 94% of 66 = $66 \times 0.94 = 62$ (rounded to the nearest whole number).

The number of pupils achieving A* - C in 2013 was 69.

The number of pupils achieving A* - C in 2013 increased by 3% when compared with the previous year.

Therefore, the number of pupils in 2013 was equal to 103% = 1.03 of the number of pupils in 2012. Since the number of pupils in the past needs to be found, division has to be used instead of multiplication (as in the calculation above): $69 \div 1.03 = 67$ (rounded to the nearest whole number).

Question 19

Pupil A:

Final percentage mark $= \frac{2}{5} \times (46 \div 60 \times 100\%) + \frac{3}{5} \times (70 \div 80 \times 100\%) = 83.17\% = 83\%$ rounded to the nearest whole number.

Pupil B:

Final percentage mark $= \frac{2}{5} \times (43 \div 60 \times 100\%) + \frac{3}{5} \times (67 \div 80 \times 100\%) = 78.92\% = 79\%$ rounded to the nearest whole number.

Pupil C:

Final percentage mark $= \frac{2}{5} \times (40 \div 60 \times 100\%) + \frac{3}{5} \times (72 \div 80 \times 100\%) = 80.67\% = 81\%$ rounded to the nearest whole number.

Pupil B got grade B as it is between 70% and 79% inclusive.

Question 20

Statement 1: In May all three museums had the lowest number of visitors across five months.

The lowest number of visitors in the British Museum was in May and it was 603.

The lowest number of visitors in the Science Museum was in May and it was 443.

The lowest number of visitors in the Natural History Museum was in May and it was 408.

Statement 1 is True.

Statement 2: The smallest difference in the number of visitors between the Science Museum and the Natural History Museum was in September.

Month	Difference in the number of visitors between the Science Museum and Natural History Museum
May	35
June	78
July	119
August	25
September	41

The smallest difference in the number of visitors between the Science Museum and Natural History Museum was in August.

Statement 2 is False.

Statement 3: The Natural History Museum has the widest range in the number of visitors.

The range in the number of visitors in the British Museum was $750 - 603 = 147$.

The range in the number of visitors in the Science Museum was $607 - 443 = 164$.

The range in the number of visitors in the Natural History Museum was $670 - 408 = 262$.

The Natural History Museum has the widest range in the number of visitors.

Statement 3 is True.

Further help

Statement 3: Range is the difference between the biggest and smallest value.

Question 21

It took 20 pupils to feed 176 cows.

One pupil feeds on average $176 \div 20 = 8.8$ cows.

25 pupils would feed $8.8 \times 25 = 220$ cows.

Question 22

The table describes the trend for each class.

Consistent trend of improvement is when values improve by the same amount each month.

Class	Is trend of improvement consistent?
4a	No

4b	No
4c	Yes, 0.3 each month
5a	No
5b	No
5c	No
6a	Yes, 0.4 each month
6b	No
6c	No

The classes showing consistent trend of improvement are 4c and 6a.

Question 23

The table describes the percentage point change for each class.

Class	Percentage point change
4a	1.5
4b	1.1
4c	1.5
5a	1.3
5b	0
5c	0.7
6a	2
6b	5
6c	2

The number of classes is 9.

The number of classes achieving at least two percentage points increase in attendance over the six-month period is 3.

The proportion of classes achieving at least two percentage points increase in attendance over the six-month period is 3 out of $9 \ = \ 1/3 \ = \ 0.3$ rounded to one decimal place.

Question 24

The amount of butter pupils have is $550g$. This is $550 \div 100 = 5.5$ times as much as in the recipe.

To follow the recipe, pupils need 5.5 times as much of other ingredients as in the recipe.

The amount of plain flour pupils need is $350g \times 5.5 \ = \ 1925g$.

The amount of ground ginger pupils need is $5.5 \times 5.5 \ = \ 30.25$ teaspoons.

The amount of ground cinnamon pupils need is $1.5 \times 5.5 \ = \ 8.25$ teaspoons.

Question 25

Statement 1: Some pupils achieved less than 20% in Mathematics.

The value for the mode indicates that at least one pupil achieved a percentage mark of 52%.

The range of marks is 30%.

So the lowest mark in Mathematics cannot be lower than: $52 - 30 = 22\%$.

Statement 1 is False.

Statement 2: At least one pupil achieved more than 60% in English.

The lowest mark possible is 0%.

The range of marks is 67%.

If someone obtained 0% then the highest mark in the class would be 67%.

So, whatever the lowest score for the class, the highest mark will be at least 67%.

Statement 2 is True.

Statement 3: All pupils achieved at least 20% in Science.

The value for the mode indicates that at least one pupil achieved a percentage mark of 70%.

The range of marks is 50%.

So the lowest mark in Science cannot be lower than: $70 - 50 = 20\%$.

Statement 3 is True.

Question 26

The race distance is 10 kilometres.

The time race started is $9\colon 00$.

The average speed of the winner is 7.5 miles per hour.

8 kilometres is approximately 5 miles.

Time is calculated by dividing distance over speed. However, both, speed and distance have to be in terms of the same unit for distance.

10 kilometres equals $10 \times 5/8 = 6.25$ miles.

The amount of time it took to complete the race is $6.25 \div 7.5 = 0.8\dot{3}$ hour $= 50$ minutes.

The winner completed the race at $9\colon 50$.

Question 27

The amount of money collected in the UK: $116.50 \times 132.22 = 15403.63$ Kenyan Shillings.

The amount of money collected in France: $148 \times 116.05 = 17175.40$ Kenyan Shillings.

The amount of money collected in the U.S.A.: $253.80 \times 103.55 = 26280.99$ Kenyan Shillings.

In total $15403.63 + 17175.40 + 26280.99 = 58860.02$ Kenyan Shillings was sent to support the mission.

Question 28

Pupil A achieved 40% in test 1.

The mark of pupil A increased by 27% in test 2, i.e. pupil A achieved 127% of mark in test 1.

Pupil A achieved 127% of 40% $= 1.27 \times 40\% = 50.8\% = 51\%$ rounded to the nearest whole number.

Pupil B achieved 62% in test 1.

The mark of pupil B decreased by 15% in test 2, i.e. pupil A achieved 85% of mark in test 1.

Pupil B achieved 85% of 62% $= 0.85 \times 62\% = 52.7\% = 53\%$ rounded to the nearest whole number.