

Maths Reasoning KS2 SATS Standard Worksheet Answers

1. (a) 451 1
(b) 110 1 [2]
2. (a)

7

 +

1	8
---	---

 =

2	5
---	---

 1
(b)

2	5
---	---

 ×

3

 =

7	5
---	---

 1
U1 [2]
3. Calculation completed correctly as shown: 1 m

5	4
---	---

 × 2 =

1	0	8
---	---	---

 U1
4. Accept an explanation which recognises that consecutive or adjoining shaded numbers have a difference of 9, eg 1 U1
 - ‘You are adding 9 each time’;
 - ‘The numbers are going up by 9 each time’;
 - ‘The numbers go down by 9 each time’;
 - ‘The rule is to add 10 and subtract 1’;
 - ‘It is going down one in the units and up one in the tens’.

Do not accept an explanation that is vague or arbitrary, eg

 - ‘The numbers get bigger’;
 - ‘The numbers get smaller’;
 - ‘The rule is to go down 116, 125, 134, 143’;
 - ‘The units are going down and tens are going up’.

Do not accept:

 - ‘The numbers are multiples of 9’.

[1]

5. An explanation which recognises that a multiple of 5 can end in 0 as well as 5, eg 1 m
U1
 - ‘Because 10 is a multiple of 5’;
 - ‘Because it can end in 0’;
 - ‘Because some numbers end in 0’.

No mark is awarded for circling ‘No’ alone.

Do not accept vague or arbitrary answers, eg

 - ‘Because not all multiples of 5 end in 5’

If ‘Yes’ is circled but a correct unambiguous explanation is

given, then award the mark.

6.

$$\begin{array}{|c|c|c|} \hline 1 & 3 & 7 \\ \hline \end{array} + \begin{array}{|c|c|} \hline 6 & 3 \\ \hline \end{array} = 200$$

Both digits must be correct for the award of the mark.

1
U1

[1]

7.

$$\begin{array}{|c|c|c|} \hline 4 & 2 & 0 \\ \hline \end{array}$$

1
U1

[1]

[1]

8.

An explanation which compares prices and which recognises that the 'half price' cost is less than the '3 for 2' cost, eg

1
U1

- 'The half price offer costs 40p, the other offer costs 60p so the half price one is 20p cheaper';
- 'I know because 40p is less than 60p';
- 'The half price offer costs 20p less'.

(Although the child has not stated the cost of each offer, we can assume that the child must have calculated them to reach this conclusion.)

Do not award the mark for ticking the 'Half price' box alone.

Do not accept an explanation which compares pencils rather than prices, eg

- 'I think because there are more pencils in the half price than the 3 for 2';
- 'Because you only get 2 in a packet and so the half price one is better'.

Also accept:

- Half price

40 p

 ✓ 3 for 2

60 p

The prices must be stated **AND** the 'half price' offer indicated.

(Although this is not the preferred form of response, the child has clearly communicated their understanding.)

Do not accept an explanation which compares prices incorrectly, eg

- 'Because the half price ones are 40p and the 3 for 2 ones are 90p'
(This shows that the child has not understood the concept of 3 for 2).

Do not accept an explanation which is vague or arbitrary, eg

- 'One pack of pencils costs less'.

Award the mark if the '3 for 2' box is ticked **OR** neither box is ticked provided a correct unambiguous explanation is given.

9.

All five digits arranged to give a sum of 60, eg

1m
U1

[1]

$$\begin{array}{r}
 \boxed{5} \\
 \boxed{1} \boxed{2} \\
 + \boxed{4} \boxed{3} \\
 \hline
 60
 \end{array}
 \quad \text{OR} \quad
 \begin{array}{r}
 \boxed{1} \\
 \boxed{2} \boxed{5} \\
 + \boxed{3} \boxed{4} \\
 \hline
 60
 \end{array}$$

Accept digits in any order provided the sum of 60 is achieved.

Do not accept a digit used more than once, or digits outside the list given.

[1]

10. Boxes completed as shown:

1
U1






8 cubes
 and
 7 cubes

Accept reverse order.

[1]

11. (a) Table completed as shown:

1
U1

favourite big cat	number of children
cheetah 	7
lion 	22
tiger 	13
panther 	8
leopard 	10
total	60

- (b) Statements ticked **and** crossed as shown:

1

Nine more children voted for the lion than for the leopard



The lion was more popular than the tiger.



$\frac{1}{4}$ of the children voted for the tiger.



All three statements must be correct for the award of the mark.

Accept any other clear way of indicating the correct responses, such as 'Y' and 'N'.

Do not accept blanks.

[2]

12. Award **TWO** marks for all six different two-digit numbers given in any order. Up to 2
U2

25	27	52	57	72	75
----	----	----	----	----	----

Award both marks even if any numbers are duplicated in the list, provided all six different numbers are given.

Do not accept 22 or 55 or 77 unless given in addition to the correct six numbers.

If the answer is incorrect, award **ONE** mark for five different correct numbers.

[2]

13. Award **TWO** marks for the correct answer of 60 up to 2

If the answer is incorrect, award **ONE** mark for evidence of appropriate method, eg

U1

$$800 - 500 = 300$$

$$300 \div 5$$

*Answer need not be obtained for the award of **ONE** mark.*

[2]

14. Any odd numbered multiple of 10, ie 10 **OR** 30 **OR** 50 **OR** 70 **OR** 90 **OR** any number ending with any of the pairs of digits above. 1

An explanation which recognises that all multiples of 20 are also multiples of 10, eg: 1
U1

- ‘Because all the numbers in the 20 times table are also in the 10 times table’
- ‘Because all multiples of 20 are multiples of 10’
- ‘Because 20 is in the 10 times table’
- ‘All multiples of 20 go in box A because 10 goes into them’
- ‘20 is a multiple of both 20 and 10, and so is 40, 60, etc’
- ‘Because if it’s not a multiple of 10, it can’t be a multiple of 20’
- ‘Because if it is a multiple of 20, it has to be a multiple of 10’
- ‘Because 10 is a factor of 20’.

Do not accept vague or arbitrary explanations, eg:

- ‘Because 40 is a multiple of 10’
- ‘Because they would be in box A instead’
- ‘Because all the multiples of 10 are multiples of 20’
- ‘Because 10 is a multiple of 20’.

[2]

15. Award **TWO** marks for all five numbers in any order as shown: up to 2
624, 642, 646, 662, 664 U1

Ignore 626 or repeats of the five correct responses.

If the answer is incorrect, award **ONE** mark for:

- four out of five numbers correct and none incorrect

OR

- five numbers correct and only one incorrect.

For ONE mark, ignore four-digit numbers.

[2]

16. An explanation which recognises that the numbers of odd and even cards are not equal, eg

1
U1

- ‘Because there are more odds than evens’;
- ‘Because there are fewer evens than odds’;
- ‘Because Sapna scores on more than half of the cards’;
- ‘Because there are only three even numbers’;
- ‘Because Josh has 3 cards and Sapna has 4 cards’;
- ‘Because Sapna has more chances’.

No mark is awarded for circling ‘No’ alone.

Do not accept vague or arbitrary explanations, eg

- ‘Because fair means half the time’;
- ‘Because there are 7 cards’;
- ‘Because there is an odd number of cards’;
- ‘Because the game is unfair’;
- ‘Because Sapna will always win’.

If ‘Yes’ is circled but a correct, unambiguous explanation is given, then award the mark.

[1]

17. (a)

11

 AND

16

1m

- (b) An explanation which recognises that the numbers in circles are multiples of 5, eg

1m
U1

- Because all the circles are multiples of 5.
- Because 35 is in the five times table.

Both numbers must be correct for the award of the mark.

Answers may be written in either order.

Do not accept vague or arbitrary explanations, eg

- ‘Because you keep on adding 5’;
- ‘Because the circles are 5 more each time’.

[2]

18.

3	2
---	---

 ×

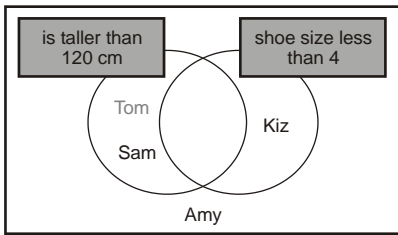
4

1 m

U1

[1]

19. Award **TWO** marks for all three names correctly placed in the regions as shown: Up to 2



U2

All three names must be correct for the award of both marks.

Do not accept a name repeated in different regions.

Accept any reasonable spelling of names, provided the intention is clear.

Do not penalise answers which offer additional names (other than those already given) on the diagram.

If the answer is incorrect, award **ONE** mark for two names correctly placed.

[2]

20. Award **TWO** marks for the correct answer of 16

Up to 2
U1

If the answer is incorrect, award **ONE** mark for evidence of appropriate working which involves a complete and correct method, eg

$$12 \times 5 = 60$$

$$11 \times 4 = 44$$

$$60 + 44 = 104$$

$$120 - 104 = \text{wrong answer}$$

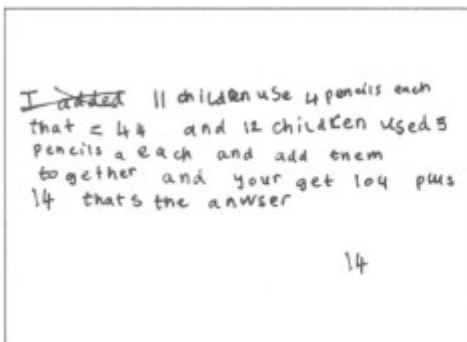
An answer must be given for the award of ONE mark.

[2]

Examples of responses

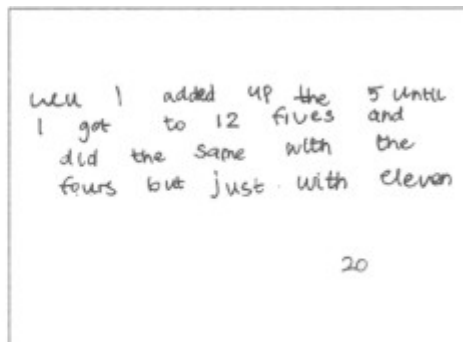
We can assume from Kate's first sentence that she correctly calculated 12 multiplied by 5 to equal 60 then added it to 44. So her explanation makes clear how she worked out that 104 pencils were used. In her attempt to subtract 104 from 120, she made an error but she describes a complete and correct method. Kate can be awarded the mark. In contrast, Bill attempted to explain how he worked out the total number of pencils used. However, as he has not recorded this total, we cannot assume that his answer of 20 was the difference between 120 and the total he calculated. His written description does not describe a complete method. Bill cannot be awarded the mark.

Kate



1 mark

Bill



0 marks

Ashley has made one calculation error when working out 11 groups of 4. Although he has not recorded the method that he used to obtain his answer of 18, we can assume that his method was correct since 120 subtract 102 equals 18. There is sufficient evidence for us to assume that Ashley's method was complete and correct. Ashley can be awarded the mark. Paula also has

calculated incorrectly 11 groups of 4 but, unlike Ashley, her follow-up working does not provide an appropriate method for calculating the number of pencils left. Her method is not complete or correct. Paula cannot be awarded the mark.

Ashley

60 pencils
42 pencils

$$60 \text{ pencils} + 42 \text{ pencils} = 18$$

1 mark

Paula

$$5 \times 12 = 60$$

$$4 \times 11 = 40$$

$$60 - 40 = 20$$

0 marks

Sumila has used a counting back method that shows that she recognised the need to subtract twelve groups of 5 and eleven groups of 4 from 120. She made one error in calculating 12 multiplied by 5. However, the method she used was complete and correct. Sumila can be awarded the mark. Michael also has used a counting back method but since he subtracted only one lot of 5 then one lot of 4 from 120 to obtain his answer, his working shows that he failed to identify a complete or correct method. Michael cannot be awarded the mark.

Sumila

$$120 - 50 = 70$$

$$70 - 44 = 26$$

1 mark

Michael

$$120 - 5 = 115$$

$$115 - 4 = 112$$

0 marks

21. 17

1
U1

[1]

22. Award **TWO** marks for all three answers correct, as shown:

Up to 2m

k = **500** m = **750** n = **250**

U1

If the answer is incorrect, award **ONE** mark for evidence of appropriate method, eg

- $2n + 3n + n + 1500$
 $1500 \div 6$

OR

a trial and improvement method, eg

- $1000 + 1500 + 500 = 3000$
 $200 + 300 + 100 = 600$
 $400 + 600 + 200 = 1200$

Accept for **ONE** mark any permutation of the correct answers,
eg

$$k = 750, m = 250, n = 500$$

Answer need not be obtained for the award of **ONE** mark.

A 'trial and improvement' method must show evidence of improvement.

[2]

23. Two numbers circled as shown:

1

74	72	73	74	75
----	----	----	----	----

An explanation which recognises that 1003 is not a multiple of 3, eg:

1
U1

- 'Because 1003 is not divisible by 3'
- 'Because 1003 is not a multiple of 3'
- 'Because 1003 is not in the 3 times table'
- 'Because I divided 1003 by 3 and there was a remainder'
- 'Because 1003 + 3 has a decimal answer'
- 'Because $1 + 0 + 0 + 3 = 4$, and 4 is not a multiple of 3'
- 'Because 1003 has a digital sum of 4'
- 'Because 1002 is the nearest in the 3 times table'
- 'Because 1000 is not divisible by 3'
- 'Because 999 is divisible by 3'.

Do not award the mark if additional incorrect numbers are circled.

Accept alternative unambiguous indications, eg ticks, crosses.

No mark is awarded for circling 'No' alone.

Do not accept vague or arbitrary explanations, eg:

- 'Because 1003 ends in 3'
- 'Because 1003 is in the third column'
- 'Because if you keep going in 3s you will go past it'.

If 'Yes' is circled but a correct unambiguous explanation is given, then award the mark.

[2]

24. Award **TWO** marks for the correct answer of 54

Up to 2m

If the answer is incorrect, award **ONE** mark for evidence of appropriate method, eg U1

- $153 - (3 \times 15) = 108$
- $108 \div 2$

*Answer need not be obtained for the award of **ONE** mark.*

[2]

25. (a) 6 1
- (b) An explanation which recognises that a total of 10 children read between 4 and 6 books, eg: 1
U1
- ‘10 children altogether read between 4 and 6 books, and $7 + 1$ makes 8, so that leaves 2 children’
 - ‘Because 7 add 1 is 8, and you need 2 more’
 - ‘Because 10 children read 4 to 6 books’
 - ‘8 and 2 more make 10 children altogether’
 - ‘ $1+7 = 8$,
 $8 + 2 = 10$ ’.
- Do not accept vague or arbitrary explanations, eg:*
- ‘Because 7 and 1 make 8’
 - ‘Because there are 2 children left’.
- [2]
26. Award **TWO** marks for the correct answer of 50 up to 2
- If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg U1
- $15 \div 3 = 5$
- $5 \times 10 =$ wrong answer
- Calculation must be performed for the award of ONE mark.*
- [2]
27. (a) Answer in the range 30% to 36% inclusive. 1m
- (b) An explanation which recognises that both teams won half their games, but both teams played a different number of games, eg 1m
U1
- Half of 30 is not the same as half of 24;
 - Because of 30 e 15 but of 24 = 12;
 - Because 15 is more than 12.
- No mark is awarded for circling ‘No’ alone.*
- Do not accept vague or arbitrary explanation, eg*
- The netball team played more games;
 - Both teams won half their games;
 - 30 is more than 24’.
- If ‘Yes’ is circled but a correct unambiguous explanation is given, then award the mark.*
- [2]
28. Award **TWO** marks for the correct answer of 14 up to 2
- If the answer is incorrect, award **ONE** mark for evidence of appropriate method, eg U1
- $17.5 \times 4 = 70$
- $70 \div 5$
- Accept for ONE mark 140 OR 1.4 as evidence of*

appropriate method.

*Answer need not be obtained for the award of **ONE** mark.*

[2]

29. Award **TWO** marks for the correct answer of 42

up to 2

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg

$$18 - 10 = 8$$

$$10 + (4 \times 8) = \text{wrong answer}$$

OR

10, 18, 26, 34, wrong answer

*Calculation must be performed for the award of **ONE** mark.*

[2]

30.

$$A = \boxed{10} \quad B = \boxed{0} \quad \begin{array}{l} 1m \\ U1 \end{array}$$

OR

$$A = \boxed{8} \quad B = \boxed{3}$$

OR

$$A = \boxed{4} \quad B = \boxed{9}$$

OR

$$A = \boxed{2} \quad B = \boxed{12}$$

OR

$$A = \boxed{0} \quad B = \boxed{15}$$

Answers must be whole numbers.

Accept negative numbers, eg $A = 12$ and $B = -3$

Do not accept $A = 6$ and $B = 6$