1. Solve $3x = 18$

$x =$.....

(Total 1 mark)

2. (a) Solve $x + 2x = 12$

$x =$ .....

(1)

(b) Solve $2y - 1 = 13$

$y =$ .....

(2)

(Total 3 marks)

3. Imran thinks of a number.

He multiplies the number by 3.
He then adds 19.
His answer is 61.
What number did Imran first think of?

……

(Total 2 marks)

4. Solve $4x - 1 = 7$

$x =$ .....

(Total 2 marks)

5. Solve

$4x + 3 = 19$

$x =$……

(Total 2 marks)

6. (a) Solve $2y = 8$

$y =$ …….....

(1)

(b) Solve $t - 4 = 7$

$t =$ …….....

(1)

(Total 2 marks)

7. (a) Solve $3x = 12$

$x =$ .....

(1)

(b) Simplify $4 \times p \times q$

.....

(1)
(Total 2 marks)

8. (a) Solve $6x = 18$

$x =$ ……

(1)

(b) Solve $2y + 3 = 8$

$y =$ ……

(2)
(Total 3 marks)

9. Solve $2x + 5 = 3$

$x =$ .....

(Total 2 marks)

10. Solve $4x - 3 = 13$

$x =$ ……

(Total 2 marks)

11. Solve $3x - 2 = 22$

$x =$ .....

(Total 2 marks)

12. (a) Solve $4x = 32$

$x =$ .....

(1)

(b) Solve $y - 3 = 11$

$y =$ .....

(1)

(Total 2 marks)

13. (a) Solve $5x = 30$

$x =$ .....

(1)

(b) Solve $2y - 4 = 11$

$y =$ .....

(2)

(Total 3 marks)

14. (a) Simplify $d + d + d$

……

(1)

(b) Simplify $2c + 4c + c$

……

(1)

(c) Solve $x + 7 = -3$

$x =$ ……..

(1)

(d) Solve $5y + 3 = 15$

$y =$ ……..

(2)

(Total 5 marks)

15. $T = 5p + 3q$

(a) Work out the value of T when $p = 2$ and $q = 4$

$T =$ .....

(2)

(b) Solve $x + 8 = 13$

$x =$ .....

(1)

(Total 3 marks)

16. Solve $5x - 3 = 17$

$x =$ .....

(Total 2 marks)

17. Solve $7x = 21$

$x =$.....

(Total 1 mark)

18. (a) Solve $3x = 12$

$x =$ .....

(1)

(b) Solve $c - 8 = 11$

$c =$ .....

(1)

(c) Solve $\frac{y}{5} = 2$

$y =$ .....

(1)

(Total 3 marks)

19. (a) Solve $x + 4 = 10$

$x =$ .....

(1)

(b) Solve $4y = 20$

$y =$ .....

(1)

(c) Solve $19 - m = 12$

$m =$ .....

(1)

(Total 3 marks)

1. 6 1

B1 cao

[1]

2. (a) $x = 4$ 1

B1 cao

(b) $y = 7$ 2

$2y = 13 + 1$

M1 for + 1 to both sides
A1 cao

[3]

3. 14 2

$61 - 19 = 42$
$42 \div 3 = 14$

M1 for – 19 or 42 seen
A1 cao

[2]

4. $4x = 7 + 1 = 2$ 2

M1 for 4x = 7 + 1
A1 cao

[2]

5. $\frac{4x}{4} = \frac{16}{4}$ 2

M1 for 4x = 19 – 3 oe or 19 – 3 ÷ 4
A1 cao

[2]

6. (a) 4 1

B1 cao

(b) 11 1

B1 cao

[2]

7. (a) 4 1

B1 cao Accept $\frac{12}{3}$

(b) $4pq$ 1

B1cao

[2]

8. (a) 3 1

B1

(b) 2½ 2

$2y = 8 - 3$

M1 for 2y = 8 – 3 oe
A1

[3]

9. –1 2

$2x = 3 - 5$

M1 for 2x = 3 – 5
A1

[2]

10. 4 2

$4x = 13 + 3$

M1 for 4x = 13 + 3 oe
A1 cao

[2]

11. 8 2

$3x = 22 + 2$

M1for 3x = 22 + 2 oe
A1 cao

[2]

12. (a) 8 1

B1

(b) 14 1

B1

[2]

13. (a) 6 1

B1 cao

(b) 7.5 oe 2

M1 for 2y = 11 + 4
A1 for 7.5 oe

[3]

14. (a) 3d 1

B1 accept d3 or 3 × d or d × 3

(b) 7c 1

B1 accept c7 or 7 × c or c × 7

(c) – 10 1

B1 cao

(d) 2.4 oe 2

$5y = 15 - 3$

$y = \frac{15-3}{5}$

M1 for 15 – 3 or 12 seen

A1 for 2.4 oe (eg $\frac{12}{5}$*)*

[5]

15. (a) $5 \times 2 + 3 \times 4$

22 2

M1 for 5 × 2 or 3 × 4 or 10 or 12 seen

A1 cao

(b) 5 1

B1

[3]

16. $5x = 17 + 3 = 20$

4 2

M1 for 5x = 17 + 3 or 5x = 20 or 20 seen

A1 cao

[2]

17. 3 1

B1for 3

[1]

18. (a) 4 1

B1 cao

(b) 19 1

B1 cao

(c) 10 1

B1 cao

[3]

19. (a) 6 1

B1 cao

(b) 5 1

B1 cao

(c) 7 1

B1 cao

[3]

1. This equation was usually solved correctly, although $x = 54$ (3×18) appeared occasionally.

2. Part (a) was well attempted, nearly three quarters of candidates gaining the mark. The most common error was in trying to simplify, or dividing 3 by 12. In part (b), however, the success rate was greater, with over 80% gaining full marks. It was disappointing to see so many trial and improvement methods for such a simple equation, many of which failed to reach the required solution, and so gained no marks.

3. **Foundation Tier**

This question was successfully answered by 76% of candidates often with little working seen. Where working was seen, there was evidence of a substantial number of candidates using a trial and improvement method.

Intermediate Tier

The vast majority of candidates gained full marks for this question. Most used a numerical approach that often incorporated inverse operations. Very few candidates used algebraic methods. Some only gained one mark because they gave embedded solutions but did not select 14 as the final answer.

4. The equation proved straightforward for many and 80% of candidates gained both marks. For those who used an algebraic approach the most common error was to write $4x = 6$ rather than $4x = 8$.

5. This was a question that either candidates made no attempt at or, as in nearly 30% of the scripts, got fully correct. In some cases students left their answer embedded as $4x + 3 = 19$ without identifying their final answer and, hence, losing a mark.

6. The incorrect answer "6" was given by about half of the candidates as their answer in part (a). In contrast part (b) was very well answered.

7. Part (a) was well answered. In part (b) the frequent error was not to simplify the expression fully.

8. The majority realised that $x = 3$ in part (a) but a significant number recorded *12* suggesting that $6x$ was being read as $6 + x$. There were very few correct responses to part (b), the most popular incorrect response being 3. Many relied on guessing a value. It was, however, encouraging to see that in others there was some evidence of an attempt to process the algebraic equation through the movement of terms.

9. Not many candidates were able to score any marks on this question and correct algebraic working was seldom seen. Most candidates just put an incorrect answer with no working. 2 and –2 were the most common incorrect answers.

10. Solving algebraic equations is never a strong point with Foundation Level candidates but it was encouraging to find that at so many were at least prepared to have a try. Many used trial and improvement methods. It was common to see in the body of the script $4 \times 4 = 16 – 3 = 13$. However the method used then collapsed with the candidate writing 12 or 13 or 16 in the answer space.

11. Many candidates did not attempt to solve these equations using algebraic manipulation, preferring to use methods of trial and improvement. A number of candidates embedded their answer and wrote 22 on the answer line. No marks were awarded for this. $3x = 20$ was also a common answer.

12. (a) Solving '$4x = 32$' was generally well handled with 55% of the candidates reaching the solution of '$x = 8$'. The most common error was to perform a subtraction rather than a division with '$32 – 4 = 28$' in evidence.
(b) Solving '$y – 3 = 11$' met with greater success with 76% getting the correct answer. Writing '$14 – 3 = 11$' to test a value proved to be a sound approach with '14' given on the answer line. In contrast attempting to combine together the '11' and '3' produced '$11 – 3$' with '8' as the outcome.

13. In part (a) two thirds of the candidates provided the correct answer of 6. The incorrect responses appeared to be a selection of random numbers.
Just over 20% were able to correctly solve the equation $2y - 4 = 11$, with 15 or 7 being a very common incorrect response as candidates did not realise that they had to divide their answer by 2 to find the value of y. Had they shown that
$2y = 15$ they would have scored a method mark. Unfortunately many did not show any algebra in their working merely writing $11 + 4 = 15$.

14. Simplifying the algebraic expressions in parts (a) and (b) gave rise to a range of answers. For $d + d + d$ it was not unusual to see d^3 rather than $3d$ whilst $2c + 4c + c$ produced unconvincing simplifications like $6c + c$, $2c + 5c$ or just $6c$. Part of the problem seemed to be in the understanding of c in the expression and this may be overcome by thinking of it as $1c$.
Solving the equation $x + 7 = -3$ lead to $x = -10$ with many correct values seen. Other values included 10 where the signs were ignored and 4 from $x = 7 - 3$.
The final part involved solving $5y + 3 = 15$ and, because y had the value of 2.4 rather than a whole number, it proved to be difficult for the majority of candidates with only 10% scoring both marks.

15. The process of two multiplications followed by an addition in an algebraic formula did not work out successfully, or even partly so, in 75% of responses. Evaluating '$5p$' when '$p = 2$' sometimes resulted in '52' which, combined with the similarly produced '34', gave rise to a final answer of '86'. Recognising that '$5p$' represented '$5 \times p$' was not evident in the majority of cases. Solving '$x + 8 = 13$' was perhaps best approached by 'looking' at the equation rather than attempting to manipulate the terms. Nearly all candidates were able to identify x as 5.

16. Solving an algebraic equation has always been a challenge and this one was no different. A solution set out to show the method being used gave the candidate access to the method mark awarded. In fact there were some excellently structured methods which produced the correct 'x' value. In contrast some found the task daunting and ended up in a sea of numbers which didn't appear to bear much relation to the original question. It was not uncommon to see the incorrect answer of 15 obtained by $5 + 15 - 3 = 17$. Just under a third of the candidates scored both available marks.

17. Around 65% of the candidates were able to solve the equation. Over 10% of the candidates scored all 3 marks with many of these using trial and improvement methods.

18. This question was quite well answered as 79% obtained the correct answer to part (a) and in part (b) the correct answer was given by 82% of candidates. In part (c) this success rate reduced to 49% as 2.5 was often seen as an incorrect answer.

19. This question was done well by the vast majority of candidates. Few candidates showed any working, most simply wrote down an answer. A common error in part (b) was 16. A common error in part (c) was 31.