



3.14F Solving Equations: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out the value of x .
 $x + 7 = 13$

(Total for Question 1 is 1 mark)

- 2** Solve the equation.
 $5x = 20$

(Total for Question 2 is 1 mark)

- 3** Work out x .
 $2x + 3 = 11$

(Total for Question 3 is 2 marks)

- 4** Solve the equation. Give your answer as a fraction if needed.
 $3x = 7$

(Total for Question 4 is 2 marks)

5 Work out x . Show all steps.

$$4x - 5 = 11$$

(Total for Question 5 is 3 marks)

6 Solve the equation. Give your answer to 1 decimal place if needed.

$$2.5x + 1.5 = 6.5$$

(Total for Question 6 is 3 marks)

7 Solve the equation. Show your method.

$$6 = 3x + 9$$

(Total for Question 7 is 3 marks)

8 Work out x . Give exact answer.

$$7x - 4 = 3x + 12$$

(Total for Question 8 is 4 marks)

9 Solve the equation. Check your answer.

$$2(x + 3) = 10$$

(Total for Question 9 is 4 marks)

10 Solve the pair of equations by substitution. Show your steps.

Equation 1: $y = 2x + 1$

Equation 2: $3x + 2y = 18$

(Total for Question 10 is 5 marks)

11 Solve the equation and state whether the solution is an integer. Show full working.

$$5(x - 2) = 3x + 4$$

(Total for Question 11 is 7 marks)

- 12** A bag contains some counters. Emma says there are n counters. After she adds 4 more counters, there are twice as many counters as she originally thought there were. Write an equation and solve it for n .
(Explain your steps.)

(Total for Question 12 is 5 marks)

Mark scheme · 3.14F Solving Equations: Foundation Tier Practice

Question 1

- **B1** $x = 6$ cao
- **Answer: 6** ($x = 6$).

Question 2

- **B1** $x = 4$ cao
- **Answer: 4** ($x = 4$).

Question 3

- **M1** subtract 3 then divide by 2 shown, e.g. $2x = 8$
- **A1** $x = 4$ cao
- **Answer: 4** ($x = 4$).

Question 4

- **M1** divide both sides by 3 shown
- **A1** $x = 7/3$ cao
- **Answer: 7/3** ($x = 7/3$).

Question 5

- **M1** add 5 to both sides shown: $4x = 16$
- **M1** divide both sides by 4 shown
- **A1** $x = 4$ cao
- **Answer: 4** ($x = 4$).

Question 6

- **M1** subtract 1.5 from both sides: $2.5x = 5.0$
- **M1** divide both sides by 2.5 shown
- **A1** $x = 2.0$ (or 2 to 1 dp) cao
- **Answer: 2.0** ($x = 2.0$).

Question 7

- **M1** subtract 9 from both sides: $3x = -3$
- **M1** divide both sides by 3 shown
- **A1** $x = -1$ cao
- **Answer: -1** ($x = -1$).

Question 8

- **M1** collect x terms: $7x - 3x = 12 + 4$ or equivalent
- **M1** simplify to $4x = 16$
- **M1** divide by 4 shown
- **A1** $x = 4$ cao
- **Answer: 4** ($x = 4$).

Question 9

- **M1** expand or divide both sides: $2x + 6 = 10$ or $x + 3 = 5$
- **M1** solve to get $x = 2$
- **M1** substitute back shown: $2(x+3)=2(2+3)=10$
- **A1** $x = 2$ cao with check
- **Answer: 2** ($x = 2$).

Question 10

- **M1** substitute $y = 2x + 1$ into $3x + 2y = 18$ shown
- **M1** obtain $3x + 2(2x+1) = 18$ or $3x + 4x + 2 = 18$
- **M1** simplify and solve for x : $7x = 16$, $x = 16/7$
- **M1** substitute x into $y = 2x + 1$ to find y
- **A1** $x = 16/7$, $y = 2*(16/7)+1 = 32/7+7/7 = 39/7$ cao
- **Answer: $x = 16/7$, $y = 39/7$.**

Question 11

- **M1** expand left side: $5x - 10 = 3x + 4$
- **M1** collect x terms: $5x - 3x = 4 + 10$ or equivalent
- **M1** simplify to $2x = 14$
- **M1** divide by 2 shown
- **M1** state $x = 7$
- **M1** substitute back shown: $5(7-2)=5*5=25$ and RHS $3*7+4=21+4=25$
- **A1** conclude $x = 7$ and solution is an integer cao
- **Answer: $x = 7$; yes, the solution is an integer.**

Question 12

- **M1** form equation: $n + 4 = 2n$ (student shows relationship)
- **M1** rearrange to get $4 = 2n - n$ or equivalent
- **M1** simplify to $n = 4$ shown
- **M1** interpret and state solution with working
- **A1** $n = 4$ cao
- **Answer: $n = 4$. (Equation $n + 4 = 2n$ gives $4 = n$ so $n = 4$; Emma originally thought there were 4 counters.)**