Practice Sheets and Solutions

Functional Mathematics

Level 3 Unit 2: Algebra

Acknowledgements

Acknowledgements

This booklet is part of a pack of resources for Functional Mathematics Level 3 which FÁS commissioned for use in their training programmes. A similar set of resources has been developed for Functional Mathematics Level 4.

A team from the National Adult Literacy Agency (NALA) and the National Centre for Excellence in Mathematics and Science Teaching and Learning (NCEMS-TL) developed and edited the materials.

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We are grateful to Kathleen Cramer and her team in Newbridge Youth Training and Development Centre who gave feedback on extracts from the Level 3 materials.

April 2012

Practice Sheet A1

Practice Sheet A1

Task 1

In the table below you must link the term to its definition.

Terms	Definitions
a. Term	1. Result when two numbers are multiplied by each other.
b. Constant	2. Two equations with at least two unknowns.
c. Product	3. A fixed value.
d. Simultaneous Equation	4. A term or group of terms >≥<≤ to some value.
e. Inequality	5. Any letter or number or a product of both.

a. → ☐

b. → ☐

c. → ☐

d. → ☐

e. → ☐

Practice Sheet A1

Task 2

Translate each algebraic expression in the table into words.

Algebraic Expression	**Translation**
a. $\frac{p}{3}$	1.
b. $x - 4$	2.
c. $5f$	3.
d. $2 + y$	4.
e. $6 \div z$	5.

Task 3

Translate each word phrase in the table into an algebraic expression.

Algebraic Expression	**Translation**
a. 16 more than m	1.
b. 10 times y	2.
c. p divided by 5	3.
d. k decreased by 7	4.
e. the difference between n and 7	5.

Practice Sheet A1

Task 4

1) A cup of tea costs €1.20. Barry buys '*x*' cups of tea per day. In terms of *x*, how much does Barry spend on tea during one week?

2) A student has four classes and wants to study for each of his classes. If he has *h* hours to study altogether and he wants to devote the same amount of time to each class, how many hours will he study per class?

3) Of the total number of shrubs in front of a building only 3 survived the winter. Allow a variable to represent the number of shrubs in front of the building before the winter. Write an algebraic expression to show how many shrubs died over the winter.

Practice Sheet A2

Practice Sheet A2

1) When 14 is subtracted from President Michael D. Higgins' age, the result is 56. Allow a variable to represent the President's age and build an equation that models this problem.

Variable: _____ Equation: _____

2) When 13 is added to Ireland's famous cyclist Sean Kelly's age, the result is 66. Allow a variable to represent Sean's age and build an equation that models this problem.

Variable: _____ Equation: _____

3) When 18 is added to the number of red stripes on the American flag, the result is 31. Allow a variable to represent the number of red stripes on the flag and build an equation that models this problem.

Variable: _____ Equation: _____

4) When 16 is subtracted from Venus Williams' age, the result is 13. Allow a variable to represent the Venus' age and build an equation that models this problem.

Variable: _____ Equation: _____

5) When 12 is added to Sonia O'Sullivan's age, the result is 52. Allow a variable to represent Sonia's age and build an equation that models this problem.

Variable: _____ Equation: _____

Practice Sheet A3

Practice Sheet A3

Find the value of x and place it in the box.

1) $x+7=16$ ☐

2) $x+10=15$ ☐

3) $5+x=12$ ☐

4) $x-4=8$ ☐

5) $x-2=9$ ☐

6) $x+7=8$ ☐

7) $x-1=14$ ☐

8) $x+565=720$ ☐

9) $-432+x=123$ ☐

10) $x-226=624$ ☐

Practice Sheet A4

Practice Sheet A4

Task 1

Fill in the blanks below using the words provided.

Subtract	Divide	Add

1) x + 4 = 6

In order to isolate the x on the left hand side of the equation,

I must _____ 4 from both sides.

2) x - 3 = 8

In order to isolate the x on the left hand side of the equation,

I must _____ 3 to both sides.

3) 2x = 8

In order to isolate the x on the left hand side of the equation,

I must _____ both sides by 2.

Task 2

Use your answers from Task 1 to solve each of the equations for x.

1) x + 4 = 6 x = ____

2) x - 3 = 8 x = _____

3) 2x = 8 x = _____

Practice Sheet A4

Task 3

1) When 9 is added to Jennifer Aniston's age (x), the result is 52. How old is Jennifer?

2) When 13 is added to Jedward's age (x), the result is 32.
How old are the twins?

Practice Sheet A5

1) Write a formula for working out the perimeter of a swimming pool whose length is 50m and whose width is 25m.

2) Rewrite the formula for the perimeter of the pool if the length were unknown.

3) The length of a soccer pitch is 35m more than its width. We also know that its perimeter is 330m.
Find the width of a pitch.

4) The length of a rugby pitch is 30m more than its width. We also know that its perimeter is 340m.
Find the width of a pitch.

5) The length of a hockey pitch is 35m more than its width. We also know that its perimeter is 290m.
Find the width of a pitch.

6) Alex Ferguson is three times as old as Nani. If the sum of their ages is 92, how old is Nani? The algebraic formula for this problem is $4x = 92$. Explain and solve.

Practice Sheet A6

Practice Sheet A6

1) When five times a certain number is reduced by 4, the result is the same as adding 7 to four times the number. Find the number.

2) When 3 is taken from five times a certain number, the result if the same as adding 6 to twice the number. Find the number.

3) When 3 is taken from twice a certain number, the result if the same as adding 3 to the number. Find the number.

4) If you add five to twice the number of All – Ireland senior hurling titles Kilkenny had by 2011, the result is the same as subtracting 28 from three times the number. How many titles had Kilkenny?

5) If you subtract 12 from six times the number of Premier League titles Manchester United had won by 2011, the result is the same as five times the number. How many titles had Manchester United?

Practice Sheet A7

Task 1

Fill in the blanks below using the symbols provided; **>** **=** **<**

1) 5 ___ 3

2) 6 ___ 6

3) 2 ___ 4

4) (3 x 4) ___ (6 x 2)

5) (3 + 2) ___ (8 – 6)

Practice Sheet A7

Task 2

Find the value of x and write it in the box.

1) $x+2\leq 5$ ☐

2) $x-1\leq 4$ ☐

3) $2x-3\leq 5$ ☐

4) $4x-5\geq 3$ ☐

5) $2x+5\leq 1$ ☐

6) $3x+4\geq -5$ ☐

7) $3x-5\leq 7$ ☐

8) $4x+3\geq -5$ ☐

9) $6-x\geq 4$ ☐

10) $3-x\leq 4$ ☐

Practice Sheet A8

Practice Sheet A8

Find the value of x and y and write your answer in the box.

1) $x + y = 9$
$x - y = 3$

2) $2x + y = 8$
$3x - y = 2$

3) $x + 2y = 7$
$2x + y = 8$

4) $4x - y = -9$
$2x - 3y = -7$

5) $2x + y = -2$
$x + 3y = 9$

6) $3x + 4y = 5$
$2x - 3y = 9$

Practice Sheet A8

7) $3x + 5y = 6$
$2x + 3y = 5$

8) $2x + 3y = 3$
$x - 4y = 7$

9) $3x - 2y = 13$
$4x + 3y = 6$

10) 400 people go to a see a Broadway show. If x paid $50 and the rest paid $35. We know that the total receipts were $18,800. Find x.

Solution Sheet A1

Solution Sheet A1

Task 1

a. ⟶ 5

b. ⟶ 3

c. ⟶ 1

d. ⟶ 2

e. ⟶ 4

Task 2

Algebraic Expression	Translation
a. $\frac{p}{3}$	1. p divided by 3
b. $x - 4$	2. x minus 4
c. $5f$	3. 5 times f
d. $2 + y$	4. 2 plus y
e. $6 \div z$	5. 6 divided by z

Solution Sheet A1

Task 3

Algebraic Expression	Translation
a. 16 more than m	1. m + 16
b. 10 times y	2. 10y
c. p divided by 5	3. $\frac{p}{5}$
d. k decreased by 7	4. k - 7
e. the difference between n and 7	5. n - 7

Task 4

1) 7*x*(1.20) or 8.40x

2) The student will study $\frac{h}{4}$ hours per class.

3) Variable to represent the number of shrubs in front of the building before the winter = s

Algebraic expression to show how many shrubs died over the winter; s – 3.

Solution Sheet A2

Solution Sheet A2

1) When 14 is subtracted from President Michael D. Higgins' age, the result is 56. Allow a variable represent the President's age and build an equation that models this problem.

Variable: P Equation: P – 14 = 56

2) When 13 is added to Ireland's famous cyclist Sean Kelly's age, the result is 66. Allow a variable represent the Sean's age and build an equation that models this problem.

Variable: S Equation: S + 13 = 66

3) When 18 is added to the number of red stripes on the American flag, the result is 31. Allow a variable represent the number of red stripes and build an equation that models this problem.

Variable: F Equation: F + 18 = 31

4) When 16 is subtracted from Venus Williams's age, the result is 13. Allow a variable represent the Venus's age and build an equation that models this problem.

Variable: V Equation: V – 16 = 13

5) When 12 is added to Sonia O'Sullivan's age, the result is 52. Allow a
6) variable represent the Sonia's age and build an equation that models this problem.

Variable: A Equation: S + 12 = 52

Solution Sheet A3

Solution Sheet A3

1) $x+7=16$ | 9

2) $x+10=15$ | 5

3) $5+x=12$ | 7

4) $x-4=8$ | 12

5) $x-2=9$ | 11

6) $x+7=8$ | 1

7) $x-1=14$ | 15

8) $x+565=720$ | 155

9) $-432+x=123$ | 555

10) $x-226=624$ | 850

Solution Sheet A4

Solution Sheet A4

Task 1

1) x + 4 = 6

In order to isolate the x on the left hand side of the equation I must subtract 4 from both sides.

2) x - 3 = 8

In order to isolate the x on the left hand side of the equation I must add 3 to both sides.

3) 2x = 8

In order to isolate the x on the left hand side of the equation I must divide both sides by 2.

Task 2

Using your answers from the previous section to solve each of the equations for x;

1) x + 4 = 6 x = 2

2) x - 3 = 8 x = 11

3) 2x = 8 x = 4

Solution Sheet A4

Task 3

3) When 9 is added to Jennifer Aniston's age (x), the result is 52. How old is Jennifer?

43

4) When 13 is added to Jedward's age (x), the result is 32. How old are the twins?

19

Solution Sheet A5

Solution Sheet A5

1) Write a formula for working out the perimeter of a swimming pool whose length is 50m and whose width is 25m.

$P = 2L + 2W$

2) Rewrite the formula if length were unknown.

$L = \frac{P-2W}{2}$

3) The length of a soccer pitch is 35m more than its width and its perimeter is 330m.
Find the width of a pitch.

65m

4) The length of a rugby pitch is 30m more than its width and its perimeter is 340m.
Find the width of a pitch.

70m

5) The length of a hockey pitch is 35m more than its width and its perimeter is 290m.
Find the width of a pitch.

55m

Solution Sheet A5

6) Alex Ferguson is three times as old as Nani. If the sum of their ages is 92, how old is Nani? The algebraic formula for this problem is 4x = 92. Explain and solve.

Allow Nani's age to be the unknown: x
Alex's age is three times Nani's: 3x
If we add their two ages together we get 92
x + 3x = 92
4x = 92
x = 23

Solution Sheet A6

Solution Sheet A6

1) When five times a certain number is reduced by 4, the result is the same as adding 7 to four times the number. Find the number.

11

2) When 3 is taken from five times a certain number, the result if the same as adding 6 to twice the number. Find the number.

3

3) When 3 is taken from twice a certain number, the result if the same as adding 3 to the number. Find the number.

6

4) If you add five to two times the number of All – Ireland senior hurling titles Kilkenny had by 2011, the result is the same as subtracting 28 from three times the number. How many titles had Kilkenny?

33

5) If you subtract 12 from six times the number of Premier League titles Manchester United had won by 2011, the result is the same as five times the number. How many titles had Manchester United?

12

Solution Sheet A7

Task 1

1) 5 > 3

2) 6 = 6

3) 2 < 4

4) (3 x 4) = (6 x 2)

5) (3 + 2) > (8 – 6)

Solution Sheet A7

Task 2

1) $x+2\leq 5$ | $x \leq 3$

2) $x-1\leq 4$ | $x \leq 5$

3) $2x-3\leq 5$ | $x \leq 4$

4) $4x-5\geq 3$ | $x \geq 2$

5) $2x+5\leq 1$ | $x \leq -2$

6) $3x+4\geq -5$ | $x \geq -3$

7) $3x-5\leq 7$ | $x \leq 4$

8) $4x+3\geq -5$ | $x \geq -2$

9) $6-x\geq 4$ | $x \leq 2$

10) $3-x\leq 4$ | $x \geq -1$

Solution Sheet A8

Solution Sheet A8

1) $x + y = 9$, $x - y = 3$ — x = 6, y = 3

2) $2x + y = 8$, $3x - y = 2$ — x = 2, y = 4

3) $x + 2y = 7$, $2x + y = 8$ — x = 3, y = 2

4) $4x - y = -9$, $2x - 3y = -7$ — x = -2, y = 1

5) $2x + y = -2$, $x + 3y = 9$ — x = -3, y = 4

6) $3x + 4y = 5$, $2x - 3y = 9$ — x = 3, y = -1

Solution Sheet A8

7) $3x+5y=6$, $2x+3y=5$ — x = 7, y = -3

8) $2x+3y=3$, $x-4y=7$ — x = 3, y = -1

9) $3x-2y=13$, $4x+3y=6$ — x = 3, y = -2

10) 400 people go to a see a Broadway show. X paid $50 and the rest paid $35. Total receipts were $18,800. Find x.

Equations:

x + y = 400

50x + 35y = 18,800

Step 1: Label the equations A and B

x + y = 400 [A]

50x + 35y = 18,800 [B]

Step 2: Get the same coefficients for either x **or** y

If we multiply equation [A] by 50 then we will have the same x coefficients

50x + 50y = 20,000 [A]

50x + 35y = 18,800 [B]

Solution Sheet A8

Step 3: Make sure the chosen coefficients have opposite signs (that is, + & -)

If we multiply equation [B] by -1 then we will have opposite signs

$$50x + 50y = 20{,}000 \quad [A]$$
$$-50x - 35y = -18{,}800 \quad [B]$$

Step 4: Add the two equations together

$$50x + 50y = 20{,}000 \quad [A]$$
$$\underline{-50x - 35y = -18800} \quad [B]$$
$$15y = 1{,}200$$

Step 5: Solve for y

$15y = 1{,}200$

$y = 80$

Step 6: Replace y in either equation to solve for x

$x + y = 400$

$x + 80 = 400$

$x + 80 – 80 = 400 – 80$

$x = 320$


1+3456789