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**FUNCTIONAL SKILLS**

Maths Level 2



**Area: Numbers and the number system**

Criterion 3: Evaluate expressions and make substitutions in given formulae in words and symbols

**Substituting numbers into formulae**

Substitute means swap or change: it is like filling in a recipe.

Let’s look at an example.

*Use* ***X*** *cups of flour.*

***X*** *= 2*

If ***X = 2***, we simply need to swap the letter X for the number 2.

*Use* ***2*** *cups of flour.*

This gives us the instructions to use 2 cups of flour.

Let’s look at another formula.

***Cost = number of tickets x £5***

If we are told the number of tickets is 3, we can replace ‘number of tickets’ with 3.

The formula becomes ***Cost = 3 x £5***

We can now work out that the total cost is £15 because 3 x 5 = 15.

Here’s another example, which uses different letters within one formula.

The formula to find the volume of a cube/cuboid is

***V = L x W x H****.*

L = length

W = width

H = height

Find the volume of a cuboid with a:

* length of 7cm
* width of 2cm
* height of 3cm

**Step 1: Substitute**

First, we need to replace the letters with their values, which is given to us in the question above.

*V = L x W x H*

*V = 7 x 2 x 3*

**Step 2: Calculate**

Next, we need to calculate the answer by following the order of precedence. This is also known as BIDMAS or BODMAS.

V = 7 x 2 x 3

V = 14 x 3

V = 42cm

**Remember:** use the correct order of precedence.

**B** = Brackets

**I** = Indices

**D** = Division

**M** = Multiplication

**A** = Addition

**S** = Subtraction

**Question 1**

Use ***x = 5*** to calculate:

*2x + 3*

(Show your working out.)

(1 mark)

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**Question 2**

Calculate *5y - 2* where ***y = 7***

(Show your working out.)

(1 mark)

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**Question 3**

Substitute **a = 4** and **b = 3** to find the answer to:

*2a + 3b*

(Show your working out.)

(2 marks)

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**Question 4**

The cost (**C***)* of producing items (**n**) is calculated using the formula:

***C (£) = 50n + 200***

What is the cost of producing 20 items?

(Show your working out.)

(2 marks)

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**Worded formulae and solving everyday problems**

Formula in words is exactly as it sounds: the formula itself uses words rather than numbers.

We then need to substitute the numbers in to solve the calculation or problem.

Here’s an example.

***Number of items + Distance from shop (miles) = Total cost (3)***

An order has 7 items and is 3.2 miles from the shop. What is the total cost?

To work out the total cost, we must substitute 7 and 3.2 into the formula, as follows:

7 is the number of items. We need to add it to the distance, which is 3.2 miles.

We can then work out the answer.

7 + 3.2 = £10.20

The total cost is £10.20

**Question 5**

*Total cost (£) = Number of items x Distance from shop (miles)*

An order has 34 items and is 8.2 miles from the shop.

**What is the total cost when rounded to the nearest whole number?**

(Show your working out.)

(3 marks)

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**Question 6**

You use the following formula to calculate your score on a recent test.

Score = 2a + 3b

You score 4 on part A (a) of the exam and 5 on part B (b).

**What is your total score?**

(Show your working out.)

(2 marks)

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**Exam practice 1**

Complete the following calculation, where *x = 4*

***3x + 5x – 2x + 1***

(Show your working out.)

(2 marks)

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**Exam practice 2**

The perimeter (**P**) of a triangle is calculated using the formula

***P = a + b + c***

Find the perimeter if:

a = 9

b = 16

c = 7

(Show your working out.)

(2 marks)

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**Exam practice 3**

The formula for the volume (**V**) of a cylinder is

***V =*** ***πr²h***

Calculate the volume if:

r = 3cm

h = 10cm

Use π = 3.14

(Show your working out.)

(2 marks)

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**Exam practice 4**

A company uses the formula below to calculate the total cost (***C***) of producing (***n***) units.

***C = 100n + 50***

How many units (***n***) can be produced if the total cost is £1,250?

(Show your working out.)

(3 marks)

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**Answers**

**Substituting numbers into formulae**

**Question 1**

x = 5

2x + 3

(2 x 5) + 3

10 + 3 = **13**

**Question 2**

y = 7

5y - 2

(5 x 7) - 2

35 - 2 = **33**

**Question 3**

a = 4

b = 3

2a + 3b

(2 x 4) + (3 x 3)

8 + 9 = **17**

**Question 4**

C = cost (£)

n = number of items

C (£) = 50n + 200

C (£) = (50 x 20) + 200

C (£) = 1,000 + 200

C (£) = **£1,200**

**Worded formulae and solving everyday problems**

**Question 5**

Total cost (£) = Number of items x Distance from shop (miles)

34 items

8.2 miles

34 x 8.2 = 278.8

Rounded to the nearest whole number = **£279**

**Question 6**

2a + 3b

a = 4

b = 5

(2 x 4) + (3 x 5)

8 + 15 = **23**

**Exam practice**

**Exam practice 1**

x = 4

3x + 5x – 2x + 1

(3 x 4) + (5 x 4) – (2 x 4) + 1

12 + 20 – 8 + 1

32 – 8 + 1

24 + 1

**25**

**Exam practice 2**

P = a + b + c

a = 9

b = 16

c = 7

P = 9 + 16 + 7

P = 25 + 7

P = **32**

**Exam practice 3**

V=πr2h

r = 3cm

h = 10cm

π = 3.14

V = 3.14 x (32) x 10

V = 3.14 x 9 x 10

V = **282.6cm3**

**Exam practice 4**

C = 100n + 50

£1,250 = 100n + 50

Subtract 50 from both sides

1250 – 50 = 100n

1200 = 100n

Divide both sides by 100

n = 1,200 ÷ 100

n = 12

**12 units**

**Your functional skills exam**

Your functional skills exams will consist of 2 papers.   
These papers will take place over the following time periods:

* Non-calculator paper – 40 minutes
* Calculator – 1 hour 50 minutes

Further information on the format that your test will take can be obtained from your training provider.

**Hints and tips**

* Find out what format your exam will be in. It may be paper-based   
  or on-screen.
* Plan what you are going to revise in advance. Don’t leave it until the last minute.
* Do as many past papers as you can so you are prepared for the day. If possible, try to complete the past papers following the same format as the actual exam.
* Find a quiet place to study and revise. It helps to sit at a table or a desk, don’t revise in bed.
* Don’t stay up all night revising the night before your exam. It’s important to have a good rest so you feel refreshed and ready to go.
* Read the question 3 times. The first time to ensure you understand what is being asked, the second time to get an understanding of what you need to do, and a third time to figure out exactly what maths techniques you should be applying.
* If you are struggling with a question, skip it and come back to it later. Try not to sit getting worked up about a difficult question, it will only waste exam time. Move on and come back to it after you have answered the other questions.
* Take note of the number of marks available. This will give you an indication of how much working out you must show. For example, 1 mark will need an answer only and more marks will need you to show your working out.
* When you’ve finished the exam, go back and check your answers. If you still have time remaining, use it to check your answers and when you have checked your answers check them again.