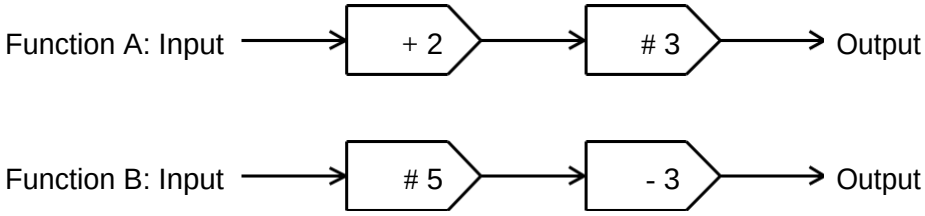
13 Function A and function B are shown below.

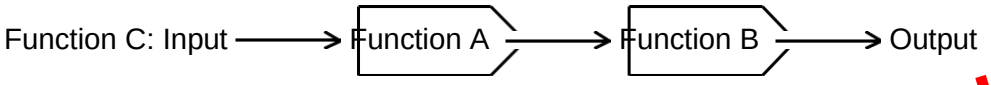


(a) The **output** of function B is x.

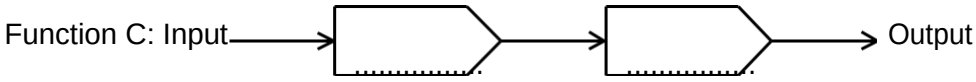
Write an algebraic expression, in terms of x, for the inverse of function B.

(a) ..... **[2]**

(b) Function C is shown below as a composite function.

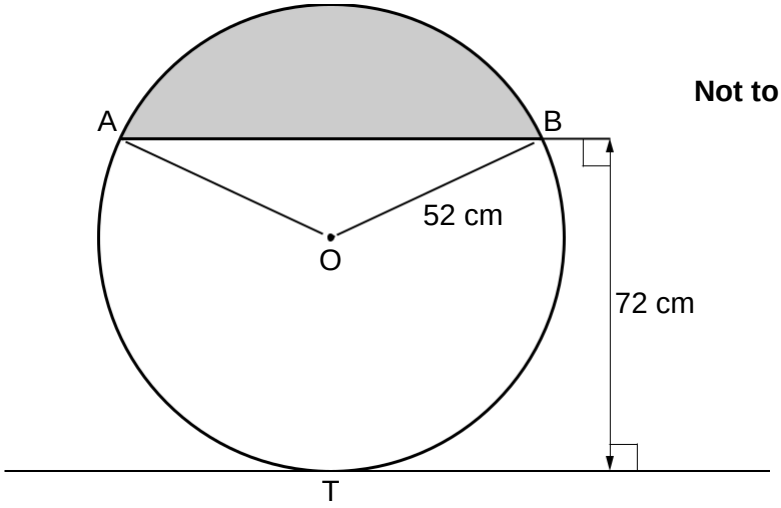


Complete the diagram below using two arithmetic operations to show function C as a single function.



[4]

14 The diagram shows a circle, centre O and radius 52 cm.



Not to scale

AB is a chord of the circle.
The line through T is a tangent to the circle.

The chord is parallel to the tangent.
The perpendicular distance between the chord and the tangent is 72 cm.

Calculate the area of the shaded segment.
You must show your working.

..... cm^2 **[6]**

15 **(a)** Solve by factorisation.

$3x^2 + 10x - 8 = 0$

(a) x = ... or x = ... **[3]**

(b) Write $x^2 + 8x + 11$ in the form $(x + a)^2 - b$.

(b) ..... **[3]**

(c) **(i)** Write down the coordinates of the turning point of the graph $y = (x - 3)^2 + 8$.

(c)(i) (..... , ...) **[2]**

(ii) Describe the **single** transformation which maps the graph of $y = x^2$ onto the graph of $y = (x - 3)^2 + 8$.

(ii) ..... **[2]**

GCSE

Mathematics - Paper 4

J560/04: Paper 4 (Higher tier)

General Certificate of Secondary Education

Mark Scheme for June 2024

Oxford Cambridge and RSA Examinations

8. The scoris **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
If you have any questions or comments for your team leader, use the phone, the scoris messaging system, or e -mail.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weakne sses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response: Not applicable in J501
    a. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer
    b. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

11. Annotations available in RM Assessor. These **must** be used whenever appropriate during your marking.

Annotation	Meaning
	Correct
	Incorrect
	Benefit of doubt
	Follow through
	Ignore subsequent working (after correct answer obtained), provided method has been completed

Exemplar responses for Q4(c)(ii)

Response	Mark
you cannot read the [exact] frequencies from it	1
It does not show frequencies/ the amount of people/ the number of students who chose which one	1
More difficult to work out how many students chose each logo	1
Harder to read frequencies	1
You can't see exactly how many people voted	1
You can clearly see the numbers on the bar chart	1
Can't see exact values	1
More steps to get the frequency	1 BOD
Bar chart shows the actual numbers(figures)	1(BOD)
Hard to read exact values	1(BOD)
It doesn't give any numbers	1(BOD)
The results aren't as clear, no numbers	1(BOD)
very difficult to add more data to it	1(BOD)
Does not show how many it is out of	1(BOD)
Harder to find the total amount	1(BOD)
Bar chart gives you more information	0
Not as in depth as pie chart / specific	0
Don't know what each section is and what it's of	0
Have to use/ have a protractor	0
People may not be able to read pie charts	0
Harder to compare than bar chart	0
Can be difficult to read	0

Question 5

Figures below show minimal values required, units are not required, accept some figures which may be rounded up. The figures given must be accurate enough to differentiate between the three sizes.

	Cost of 1 kg	Cost of 1g	Amount for £1	Amount for 1p	Amount for £7.70	Amount for £32.4	Amount for £53.9
700g	£11	£0.011	90[.9…] to 91 g	0.90[9] to 0.91 g	700 g	2945… g	4.9 kg
3 kg	£10.8[0]	£0.0108	92.5 to 92.6 g	0.925 to 0.926 g	712… g	3000 g	4.99… kg
5 kg	£10.7[8]	£0.0107[8]	92.7… g	0.927…g	714… g	3005… g	5 kg

	Cost of 700 g	Cost of 3 kg	Cost of 5 kg	Cost of 15 kg			
700g	£7.70	£33	£55	£165			
3 kg	£7.56	£32.40	£54	£162			
5 kg	£7.54[6] or £7.55	£32.3[4]	£53[.90]	£161[.70]			

Alternative method 2
Allow comparison in pairs e.g.
Compare 3 kg and 5 kg by working out the cost of 15 kg
3 kg is £162 and 5 kg is £161.70 so 5 kg is cheaper

Now compare 700 g and 5 kg by working out the cost of 7 kg
700 g is £77 and 5 kg is £75.46

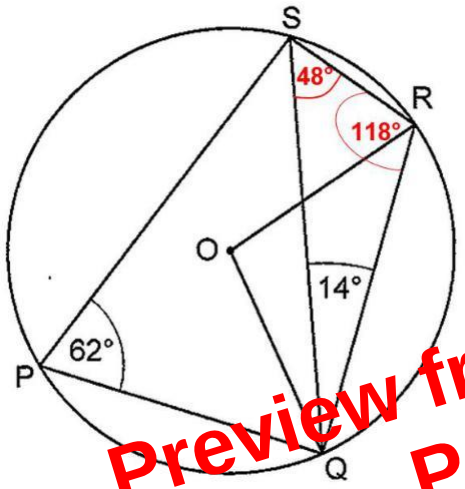
Exemplar responses for Q10

The error is……	**Mark**
The formula should be $y = kx$ [not the one they use]	**1**
the formula they use is not direct proportion	**1**
He should have multiplied x and c not added	**1**
They have added the constant [instead of multiplying]	**1**
They have used the wrong equation	**1**
It should not be + [c]	**1**
They should not add	**1**
$y = x + c$	**1**
They are directly proportional	**0**

Exemplar responses for Q11(b)

	Mark
The pass before does not affect the results after	**1**
They are independent	**1**
The first task results do not affect the second	**1**
Passing first task does not affect the second task	**1**
Passing the second does not rely on passing the first	**1**
They are not linked	**1**
Same probability to pass second on both times	**0**
The probabilities of the tests do not change	**0**
The probability of passing will always stay the same	**0**
Both second tests are the same	**0**

Working for Q12(a)



Hence angle ROQ = 96° from which ORQ=OQR=42°, SRO=76°, OQS=28°.

Alternative method 1
Some candidates are joining OP, however ROP are not co-linear but point P can be moved so that ROP is a straight line and maintaining angle SPQ as 62°.
Mark this;
B1 for angle SPO = 14°
B1 for angle OPQ and angle OQP = 48°
B1 for angle QOP = 84° or OQR and ORQ = 42°
to maximum of **B2**