



Bishop Luffa Bridging Work



CORE MATHS

Foundations of Advanced Mathematics AS Pure Mathematics Bridging Test 1

Questions

1 Three of the following statements are true and **one** is false. Which one is **false**?

A The highest common factor (HCF) of 42 and 70 is 14.

B 97 is a prime number.

C $\frac{1}{4} + \frac{1}{12} = \frac{1}{3}$

D 15% of £80 is £10.00.

2 The number 7654.451 is written below in four different ways.

Three of the ways are correct and **one** is incorrect. Which one is **incorrect**?

A 8000, correct to the nearest thousand.

B 7654.5, correct to 1 decimal place.

C 7600, correct to 2 significant figures.

D 7654, correct to the nearest integer.

3 An electrician charges the following rates:

Call-out charge including work for up to one hour	£42
For each extra half-hour or part of a half-hour	£21

The electrician completed a job which took 1 hour 35 minutes.

Which **one** of the following is the **correct** charge?

A £42

B £63

C £66.50

D £84



- 4 The table below lists the areas, in square miles, of the continents of the world.

Continent	Area (square miles)
Africa	1.2×10^7
Asia	1.5×10^7
Europe	9.0×10^6
North America	7.5×10^6
South America	4.5×10^6
Australasia	6.0×10^6

Three of the following statements are true and **one** is false. Which one is **false**?

- A North and South America together cover the same area as Africa.
- B Asia has the largest area.
- C Europe is 50% larger than Australasia.
- D Australasia is 4 times as big as Asia.
- 5 Which **one** of the following has the **largest** value?
- A $62\frac{1}{2}\%$ of 16
- B 8 divided by $\frac{2}{3}$
- C $\frac{4}{5}$ of 15.5
- D $\sqrt{132.25}$
- 6 Catherine chooses three numbers, x , y and z . She adds the first two, then multiplies her answer by itself and finally multiplies her result by the third number.

Which **one** of the following is a **correct** algebraic expression for her final answer?

- A $z(x+y)^2$
- B $[z(x+y)]^2$
- C $x^2z + y^2z$
- D zx^2y^2



7 Three of the following statements are true and **one** is false. Which one is **false**?

A $2^3 \times 3^2 = 6^5$

B $3^8 \div 3^4 = 3^4$

C $2^9 \div 2^{-3} = 2^{12}$

D $\frac{2^5 \times 3^4}{6^2 \times 9} = 2^3$

8 Three of the following statements are true and **one** is false. Which one is **false**?

A $x^2 - 5x - 14 = (x - 7)(x + 2)$

B $x^2 - 25 = (x - 5)^2$

C $(3x - 4)(4x - 3) = 12x^2 - 25x + 12$

D $2x^2y + 4xy^2 = 2xy(x + 2y)$

9 In the four statements below, n stands for an integer.

Three of the following statements are true and **one** is false. Which one is **false**?

A $n - 2 > 3$ for the integers 6, 7, 8,

B 0, 1, 2 and 3 are the only integers for which $n^2 \leq 9$.

C $3 - 2n > 1$ for the integers 0, -1, -2,

D $2 < n + 6 < 10$ can be rewritten as $-4 < n < 4$.

10 When a pot of paint is half full it weighs 4 kg. When it is one quarter full it weighs 3 kg.

Which **one** of the following is the **correct** weight of the pot of paint when full?

A 4 kg

B 6 kg

C 8 kg.

D 12 kg



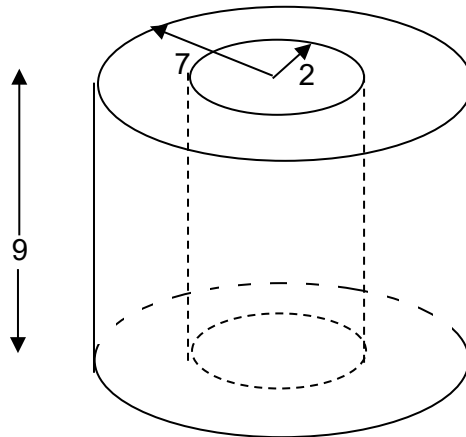
Foundations of Advanced Mathematics AS Pure Mathematics Bridging Test 2

Questions

- 1 Anne has a number of identical rectangular boxes. She measures the length to be 8 cm, the width 5 cm and the height 4 cm, all correct to the nearest cm. Three of the following statements are true and **one** is false. Which one is **false**?
- A The greatest possible length when 10 boxes are placed end to end is 85 cm.
- B The width when 2 boxes are placed side by side is no more than 11 cm.
- C The height when 3 boxes are stacked is at least 10.5 cm.
- D The greatest possible volume of a box is 160.5 cm^3 .
- 2 Three of the following statements are true and **one** is false. Which one is **false**?
- A 12 inches is about 30 centimetres.
- B 5 tonnes is 5000 kilograms.
- C 1 litre is about 1.8 pints.
- D 25 kilometres is about 40 miles.
- 3 Three of the following statements are true and **one** is false. Which one is **false**?
- A $-2 \times -3 = -6$
- B $(-2) - (-3) = 1$
- C $\frac{3+4 \times 13}{17-3 \times 2} = 5$
- D $20 - 2 \times 3 = 14$
- 4 In this question, $a = 2$, $b = 3$, $c = -1$. Three of the following statements are true and **one** is false. Which one is **false**?
- A $ab^2 = 18$
- B $abc^3 = -6$
- C $ab + bc + ca = 1$
- D $\frac{a+2b}{4-2c} = 4$



5 A piece of insulation fits round a pipe. It has the shape of a cylinder with a smaller cylinder cut out of it, as shown in the diagram. The inside radius is 2 cm and the outside radius is 7 cm. The length is 9 cm.



Which **one** of the following is the **correct** volume of the piece of insulation, correct to 3 significant figures?

- A 1270 cm³
- B 707 cm³
- C 6360 cm³
- D 1340 cm³

6 Michael and Madison are rearranging equations.

Michael has rearranged $v^2 = u^2 + 2as$ to give $a = \frac{(v-u)(v+u)}{2s}$.

Madison has rearranged $s = \frac{1}{2}(u+v)t$ to give $v = u + \frac{2s}{t}$.

Which **one** of the following statements is **true**?

- A Both Michael and Madison are incorrect.
- B Both Michael and Madison are correct.
- C Michael is correct and Madison is incorrect.
- D Michael is incorrect and Madison is correct.

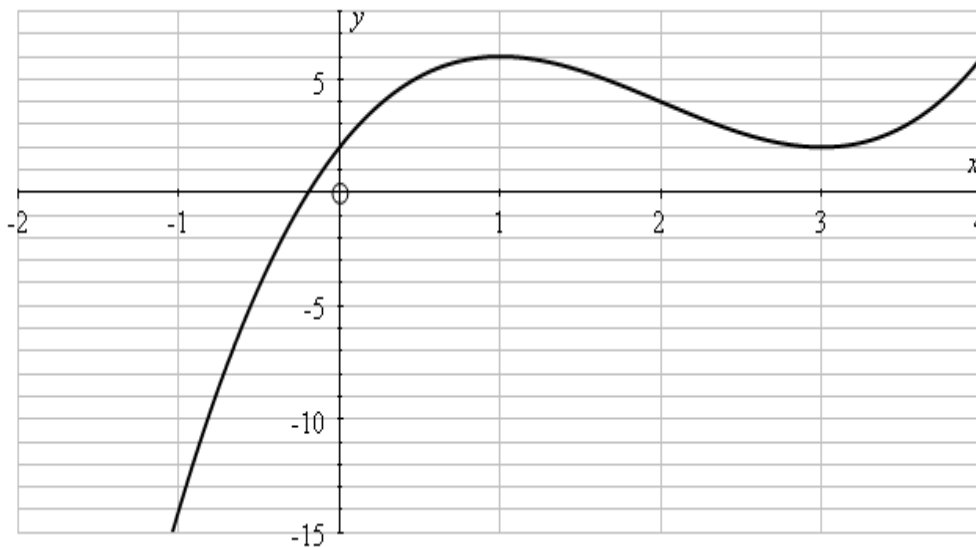


7 This question concerns the graph of the function $y = x^3 - 6x^2 + 9x + 2$.

The following table gives values of y for some integer values of x .

x	-1	0	1	2	3	4	5
x^3	-1	0		8			
$-6x^2$	-6	0		-24			
$9x$	-9	0		18			
2	2	2		2			
y	-14	2		4			

Part of the graph is shown on the grid below.



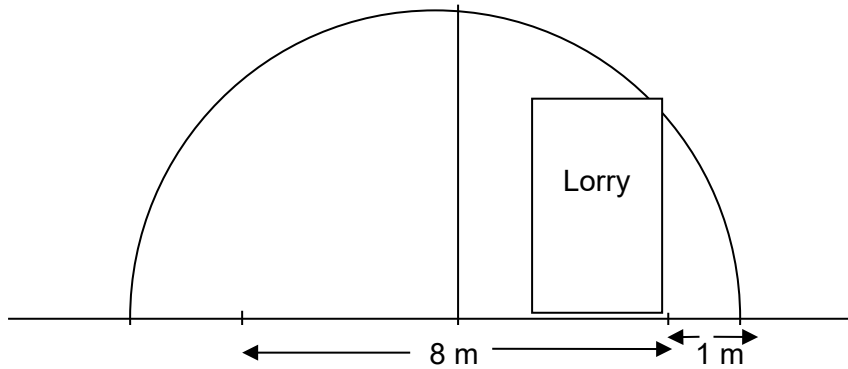
In order to complete this question you are advised to complete the table above and complete the graph on the grid using your values from the table.

Three of the following statements are true and **one** is false. Which one is **false**?

- A The value of y when $x = 3$ is 2.
- B Between $x = -1$ and $x = 3$ the maximum value of y occurs when $x = 1$.
- C The gradient of the curve when $x = 2$ is approximately 3.
- D The area under the curve between the x -axis, the lines $x = 0$, $x = 2$ and the curve is approximately 10 square units.

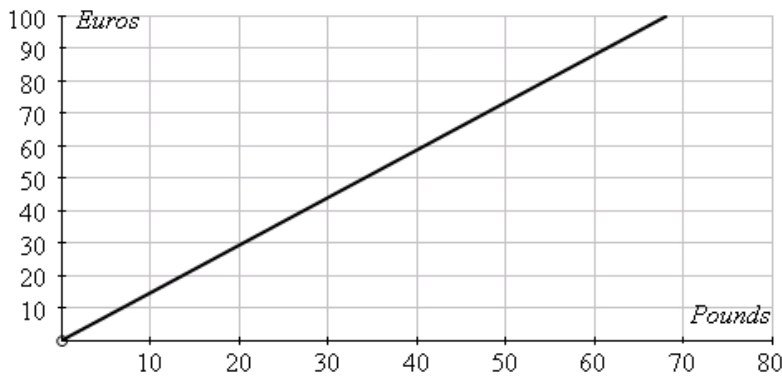


- 8 A road tunnel has a semicircular cross-section, as shown in the diagram. The road surface is on the diameter AB of the semicircle which has length 10 metres. The road surface is symmetrically placed in the tunnel and of width 8 metres, leaving 1 metre on either side.



Which **one** of the following is the maximum height of a lorry that drives on the edge of the road?

- A 2 m B 3 m C 4 m D 5 m
- 9 The graph below shows the conversion of pounds, £, to euros, €, one day last year.



Three of the following statements are true and **one** is false. Which one is **false**?

- A £40 was equivalent to nearly €60.
- B €40 was approximately equivalent to £27.
- C One euro was worth approximately 68p.
- D On another occasion I paid £70 for €100. The conversion graph for this exchange rate has a greater gradient than that drawn above.
- 10 Which **one** of the following gives the solution, correct to 1 decimal place, of the equation $x^2 + 3x = 1$?



- A** $x = 0.3$ and $x = -3.3$
- B** $x = -0.3$ and $x = 3.3$
- C** $x = -0.4$ and $x = 2.6$
- D** $x = 0.4$ and $x = -2.6$



Foundations of Advanced Mathematics AS Pure Mathematics Bridging Test 3

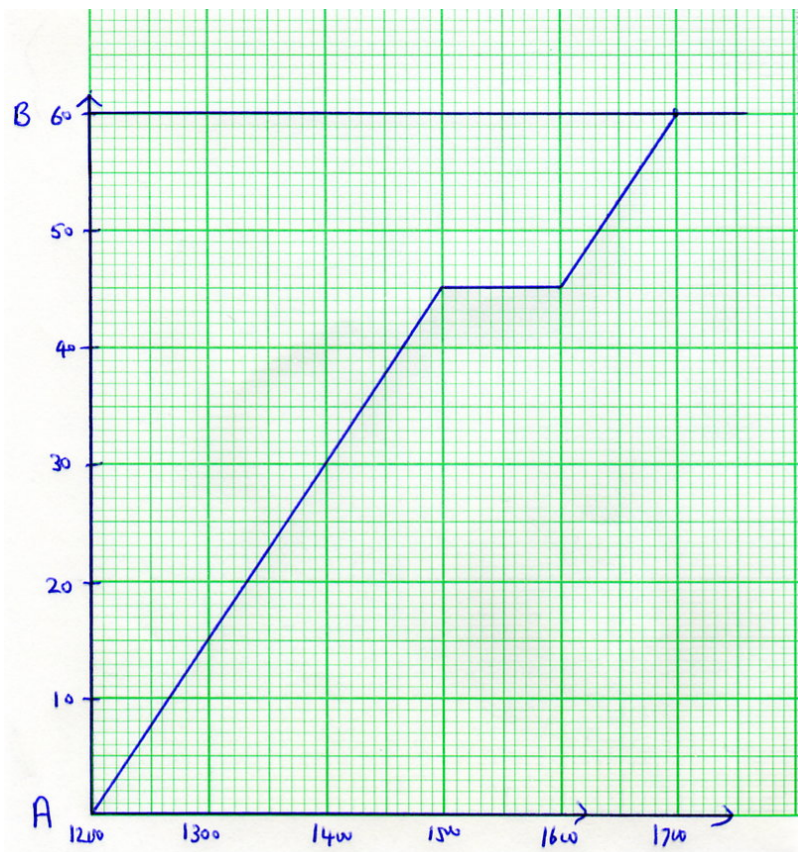
Questions

- 1 John records the distance that he runs as 20 kilometres, correct to the nearest kilometre. He also notes that the run has taken him 100 minutes, correct to the nearest minute.

Which **one** of the following is the **correct** value John's least possible average speed?

- A 11.64 km h⁻¹, correct to 2 decimal places.
 - B 11.29 km h⁻¹, correct to 2 decimal places.
 - C 12.36 km h⁻¹, correct to 2 decimal places.
 - D 12 km h⁻¹ exactly.
- 2 Andy set off at 1200 one day on a bicycle from Portville to Queentown, a distance of 60 kilometres. While riding he travelled at a speed of 15 kilometres per hour, but stopped for an hour on the way. The distance-time graph below shows this journey.

At 1500, Bob set off from Queentown to Portville, riding at a speed of 20 kilometres per hour.





To answer this question you need to draw a line on the graph to represent Bob's journey.

Which **one** of the following statements is **true**?

- A Andy and Bob pass each other at 1345.
- B Andy and Bob pass each other at 1445.
- C Andy and Bob pass each other at 1545.
- D Andy and Bob do not pass each other.

- 3 In a group of students, twenty are male and thirty are female.
Three tenths of the students are aged 20 years or less and one fifth are over 40 years old.

Three of the following statements are true and **one** is false. Which one is **false**?

- A The ratio, the number of males: the number of females = 2:3.
- B 35 students are aged over 20.
- C The number of males in the group is $0.4 \times$ (the total number in the group).
- D 60% of students are aged over 20 but not over 40.

- 4 You are given that $a = 2\frac{2}{3}$ and $b = \frac{1}{4}$.

Three of the following statements are true and **one** is false. Which one is **false**?

- A $a + b = 2\frac{11}{12}$
- B $a - b = 2\frac{5}{12}$
- C $a \times b = \frac{2}{3}$
- D $a \div b = \frac{3}{2}$

- 5 Which **one** of the following is the **correct** simplification of $2(x + 3) - 3(5 - 2x)$?

- A $-4x - 9$
- B $8x - 9$
- C $8x - 12$
- D $4x - 12$



- 6 John is using the formula $t = \frac{2s}{u+v}$.
He is given the values $s = 59.6$, $u = 2.3$ and $v = 7.7$. He does not know the accuracy of these values.

Three of the following statements are true and **one** is false. Which one is **false**?

- A If the values are exact, $t = 11.92$.
- B If the values have been rounded to 1 decimal place, the smallest possible value of t is 12.0, correct to 1 decimal place.
- C If John rounds the values to the nearest integer, then his value for t is 12.
- D A rearrangement of the formula is $v = \frac{2s-ut}{t}$.
- 7 Which **one** of the following is a **correct** simplification of $\frac{1-x}{3} - \frac{2(x-3)}{5}$?

- A $\frac{4-3x}{2}$
- B $\frac{23-11x}{15}$
- C $\frac{x-13}{15}$
- D $\frac{x+23}{15}$

- 8 Three of the following statements are true and **one** is false. Which one is **false**?

- A $(3xy^2)^3 = 27x^3y^6$
- B $(3xy^2) \times 3 = 27xy^2$
- C $\frac{x^5 \times x^3}{x^4} = x^4$
- D $2(x-1) - 3(2-x) = 5x-8$



9 Three of the following statements are true and **one** is false. Which one is **false**?

- A $x = 3$ is the solution of the equation $2(x + 1) = 8$.
- B $x = -4$ is the solution of the equation $3x - 12 = 0$.
- C $x = -3$ is one of the roots of the equation $x^2 - 9 = 0$.
- D The two roots of the equation $x^2 = 8x$ are $x = 0$ and $x = 8$.

10 Emma is attempting to solve this pair of simultaneous equations.

$$\begin{aligned} 3x + 2y &= 9 & \text{(i)} \\ 4x - y &= 1 & \text{(ii)} \end{aligned}$$

Her working is shown in the four steps below, but her final answer is incorrect.

In **which** of the following steps **A**, **B**, **C** or **D** does her **first** error occur?

- A Multiply (ii) by 2: $8x - 2y = 2$ (iii)
- B Add (iii) and (i): $11x = 11$ (iv)
- C Divide both sides of (iv) by 11: $x = 1$
- D Substitute this value of x into (ii): $4 - y = 1$ gives $y = 5$