Foundations of Advanced Mathematics

AS Pure Mathematics Bridging Test 10

Questions

1 Three of the following calculations are correct and **one** is incorrect. Which one is **incorrect**?

A $\dfrac{\left(3.4\times10^{3}\right)\times\left(4.8\times10^{5}\right)}{\left(1.2\times10^{-2}\right)}=1.36\times10^{11}$

B $3.8\times10^{5}-2.4\times10^{4}=3.56\times10^{5}$

C $(3.2\times10^{3})\times(3.5\times10^{5})=1.12\times10^{16}$

D $4.2\times10^{-3}+4.5\times10^{-1}=4.542\times10^{-1}$

2 A modern commuter train consists of four coaches, all of the same length. Which **one** of the following is a reasonable estimate for the total length of the train?

A 20 metres

B 40 metres

C 80 metres

D 160 metres

3 State which **one** of the following is most likely to be the volume of air of an average household oven.

A 60 000 cm^3 **B** 6 000 000 cm^3 **C** 600 000 cm^3 **D** 600 cm^3

4 An optician has a sale in which all pairs of glasses are offered with 25% off marked prices.

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

A Glasses originally priced at £130 are sold for £97.50.

B Glasses sold for £112.50 in the sale were originally £150.

C "25% off" means that you only pay a quarter of the original price.

D Kevin saves £45 by buying a pair of glasses in the sale. The original price of the glasses was £180.

5 In this question, $a = 2,\ b = -3,\ c = 4,\ d = 0$.

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

A $3b^3 = 81$.

B $abcd = 0$.

C $ab + bc + cd = -18$.

D $\dfrac{a+b}{c+d} = -0.25$.

6 The cooking instructions for a joint of meat are as follows.

> **Cook for ½ an hour per kilogram plus 15 minutes**

T is the cooking time in minutes.

m is the mass of the joint of meat in kilograms.

Which **one** of the following is the correct formula for T?

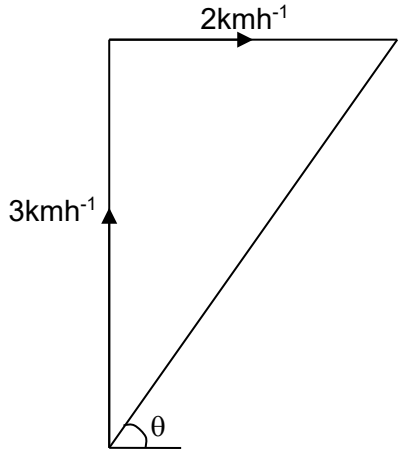
A $T = 30m + 15$

B $T = 30(m + 15)$

C $T = \dfrac{1}{2}m + 15$

D $T = \dfrac{1}{2}(m + 15)$

7 Paula swims across a river with a speed of 3 kmh^{-1}. She heads directly for the opposite bank at 3 kmh^{-1} but is carried downstream by the current at 2 kmh^{-1} so that she travels at an angle of $\theta°$ to the bank, as shown in the diagram.



Which **one** of the following is the value of θ, correct to the nearest degree?

A 56° **B** 48° **C** 42° **D** 34°

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

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

B $2^4 \div 2^5 = 2^{-1}$

C $\dfrac{15^2 \times 4^3}{5^2 \times 8^2} = 3^2$

D $2^7 \div 2^{-5} = 2^{12}$

9 Which **one** of the following is the **correct** solution of the equation $x^2 + 2x - 12 = 0$?

A $x = 3$ or $x = -4$.

B $x = -2$ or $x = 6$.

C $x = -1 + \sqrt{13}$ or $x = -\left(1 + \sqrt{13}\right)$.

D $x = 4.6$ or $x = 2.6$, both correct to 2 significant figures.

10 The equation of a curve is $y = x^2 + 2x - 7$. Three of the following points lie on the curve and **one** does not. Which one does **not**?

A (-2, -7) **B** (3, 8) **C** (6,41) **D** (-6, 41)