Foundations of Advanced Mathematics
AS Core Mathematics Bridging Test 9

Questions

1 Jo has a set of scales. The scales can be read to the nearest gram.

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

A Jo records a mass as 0.675 kg. This is consistent with the accuracy of the scales.

B Jo weighs 10 identical coins together. Calculation of the average gives the mass of each coin to the nearest 0.1 g.

C Jo records a mass as 50 g. The lowest possible value of this mass is 45 g.

D A mass recorded as 50 g could have an error of up to 1%.

2 The number 1234.567 is written below in four different ways.

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

A 1234.6, correct to 1 decimal place.

B 123, correct to 3 significant figures.

C 1.2×10^3, correct to 2 significant figures.

D 12×10^2, correct to the nearest 100.

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

A 43% is equivalent to 0.43.

B 0.0001 is equivalent to 1%.

C 28% is equivalent to $\frac{7}{25}$.

D $\frac{17}{20}$ is equivalent to 0.85.

4 Which **one** of the following value of $\frac{(22.85+11.19)^2}{3.7\times 2.3}$, correct to 1 decimal place?

A 37.6

B 720.3

C 100.7

D 136.2

5 Shona says that the formula for the volume of a cone, $V = \frac{1}{3}\pi r^2 h$, can be rewritten as $r = \sqrt{\frac{3V}{\pi h}}$.

Olivia says that the formula for the period of a pendulum, $T = 2\pi\sqrt{\frac{l}{g}}$, can be rewritten as $l = \frac{T^2 g}{4\pi^2}$.

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

A Shona is right but Olivia is wrong.

B Olivia is right but Shona is wrong.

C Both Olivia and Shona are wrong.

D Both Olivia and Shona are right.

6 Wendy is asked to carry out the following instructions.

Think of a number
Double it
Add 3
Square the result
Divide by 4

When writing down the process algebraically she takes the number to be *x*.
She then works through the instructions.

Which **one** of the following expressions is the **correct** result?

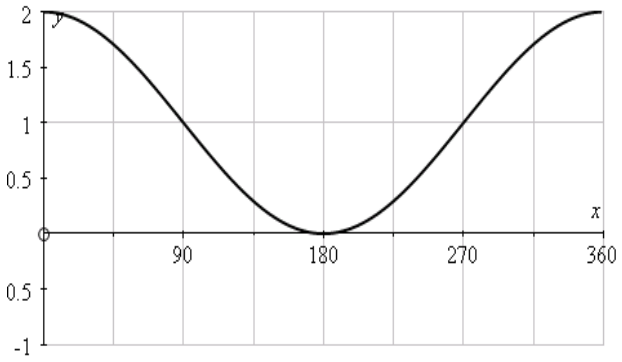
A $\frac{(2x+3)^2}{4}$

B $\frac{2(x+3)^2}{4}$

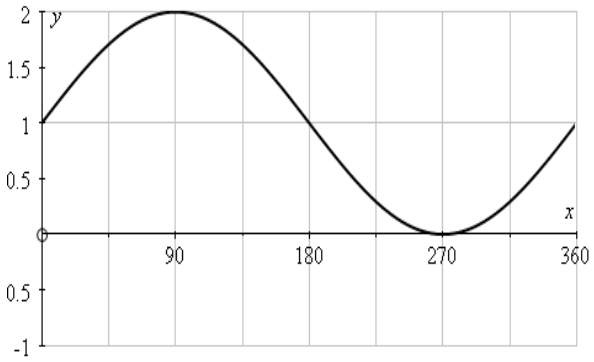
C $\frac{2x+3^2}{4}$

D $2x + \frac{3^2}{4}$

7 Which **one** of the following is the **correct** graph of $y = 1 + \cos x$?



A



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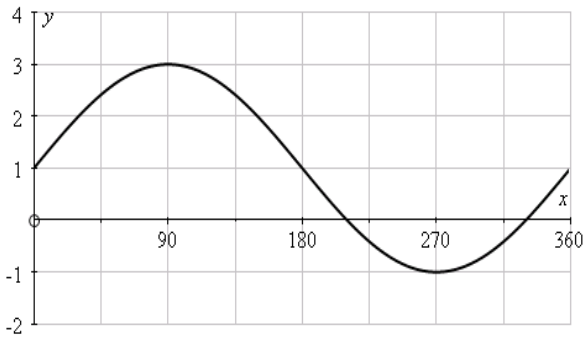

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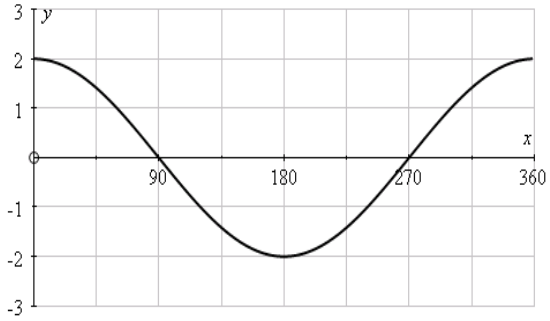


D

8 Paula is attempting to solve the following simultaneous equations.

$$3x - 4y = 5 \quad \text{(i)}$$
$$2x + y = 7 \quad \text{(ii)}$$

Her attempt is shown in the four steps below, but the answer is incorrect.

In which of the following lines **A**, **B**, **C**, **D** does the **first** error appear?

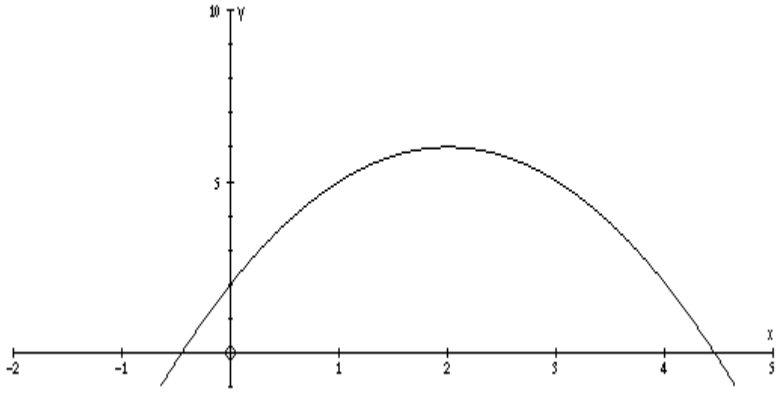
A $3x - 4y = 5$ (i)
Multiply (ii) by 4: $8x + 4y = 28$ (iii)

B Add (i) and (iii): $11x = 33$

C Divide by 11: $x = 3$

D Substitute in (ii): $y = -1$

9 The curve shown has equation $y = 2 + 4x - x^2$.



Which **one** of the following is an estimate for the gradient of the curve at the point where $x = 4$?

A 4 **B** $\frac{1}{4}$ **C** $-\frac{1}{4}$ **D** –4

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

A $\left(2xy^2\right)^3 = 6xy^6$

B $2xy^3 \times 3x^3y = 6\left(xy\right)^4$

C $2\left(x-1\right) - 3\left(2x-3\right) = 7 - 4x$

D $\frac{x^3 \times x^4}{x^7} = 1$