Foundations of Advanced Mathematics

AS Pure Mathematics Bridging Test 12

Questions

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

A An amount of money is divided in the ratio 3 : 1. The smaller part is 25% of the total amount.

B A dress originally priced at £49.50 is reduced by 20%. The new price is £39.60.

C Increasing a price by 30% is the same as multiplying the price by 1.3.

D Decreasing a price by 30% is the same as dividing the price by 1.3.

2 Djuna records the distance that she cycles as 6 kilometres, to the nearest 100 metres. She also notes that it has taken her 32 minutes, to the nearest minute.

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

A The greatest possible average speed is 192 metres per minute, correct to the nearest integer.

B The least possible average speed is 183 metres per minute, correct to the nearest integer.

C The greatest possible average speed is 11.52 kilometres per hour, correct to 2 decimal places.

D The least possible average speed is 10.89 kilometres per hour, correct to 2 decimal places.

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

A $s = ut + \frac{1}{2}at^2$ may be arranged to give $a = \frac{2(s-ut)}{t^2}$

B $y = 4x - 5$ may be arranged to give $x = \frac{y}{4} + 5$

C $x = \sqrt{\frac{A}{6}}$ may be arranged to give $A = 6x^2$

D $\frac{PV}{T} = R$ may be arranged to give $P = \frac{RT}{V}$

4 Which **one** of the following is the **correct** simplification of $\frac{2(2x+1)}{3} - \frac{x-3}{5}$?

A $\frac{17x+24}{15}$ **B** $\frac{17x+19}{15}$ **C** $\frac{17x+14}{15}$ **D** $\frac{17x+1}{15}$

5 The length of each edge of a solid cuboid is doubled to make a similar cuboid.

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

A The length of the diagonal of a face is doubled.

B The area of each face of the cuboid is increased by a factor of 4.

C The total surface area of the cuboid is increased by a factor of 6.

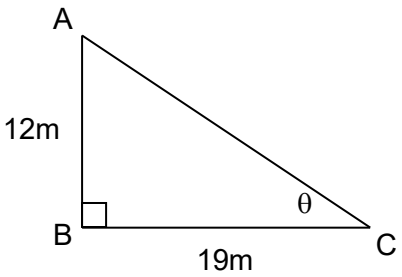
D The volume of the cuboid is increased by a factor of 8.

6 Which **one** of the following is the solution of the equation $3x^2 - 11x - 7 = 0$?

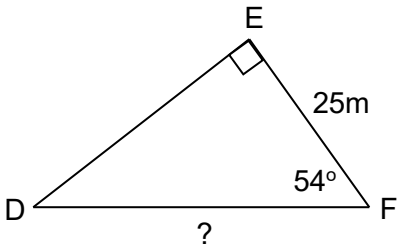
A $\frac{11 \pm \sqrt{205}}{6}$ **B** $\frac{-11 \pm \sqrt{205}}{6}$ **C** $\frac{11 \pm \sqrt{37}}{6}$ **D** $\frac{-11 \pm \sqrt{37}}{6}$

7 Anna and Emily are both solving trigonometry problems.

Anna's Problem



Emily's Problem



Anna claims that angle ACB is 32°, correct to the nearest degree.
Emily claims that length DF is 43 m, correct to the nearest metre.

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

A Anna and Emily are both correct.

B Anna is correct and Emily is incorrect.

C Anna is incorrect and Emily is correct.

D Anna and Emily are both incorrect.

8 A straight line has a gradient of -3 and an intercept of 2 on the y-axis.

Which **one** of the following is a **correct** equation of the line?

A $y - 3x + 2 = 0$

B $x + 2y - 3 = 0$

C $y + 3x - 2 = 0$

D $x + 3y + 2 = 0$

9 A point P has coordinates (4, 1).

Which **one** of the following points is nearest to P?

A (4, 9) **B** (-3, 5) **C** (3, -7) **D** (-1, -5)

10 The length of an aeroplane flight is 5200 kilometres, correct to the nearest 100 kilometres. The duration of the flight is 6 hours and 20 minutes, correct to the nearest 10 minutes.

Which **one** of the following is the **greatest** possible average speed of the aeroplane, correct to the nearest 10 km h–1?

A 820 km h^{-1} **B** 830 km h^{-1} **C** 840 km h^{-1} **D** 850 km h^{-1}