

Foundations of Advanced Mathematics
AS Pure Mathematics Bridging Test 5

Questions

1 Use the following conversions in this question.

$$1 \text{ kilometre} = 0.6214 \text{ miles}$$

$$1 \text{ gallon} = 4.546 \text{ litres}$$

$$1 \text{ kilogram} = 2.205 \text{ pounds}$$

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

- A 55 litres < 12 gallons
- B 9 kilograms < 20 pounds
- C 10 kilometres > 6 miles
- D 7 miles < 11.5 kilometres

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

- A All of the prime factors of 2007 are less than 200.
- B $2007 = \left[(4^2 - 1)^2 - 2 \right] \times 3^2$
- C $2007 = 13^3 - (1^3 + 4^3 + 5^3)$
- D The area of a square of side 44.8 cm differs from 2007 cm² by less than 0.05 cm².

3 It was reported on a web-site that 150 million text messages were sent from phones in the UK on New Year's Day, 2005 and that this represented a "huge increase" on the 111 million text messages sent on January 1, 2004.

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

- A The increase from 111 million to 150 million is an increase of about 26%.
- B 150 million messages in a day represents an average of over 1730 per second.
- C If there were 150 million messages sent every day in 2005 then the total number of messages would have exceeded 5×10^{10} messages.

- D** Given that the number of text messages on New Year's Day, 2005 is given to 3 significant figure accuracy only, the difference in the greatest possible number and the least possible number per second is 11.

- 4** The cooking instructions for a turkey are as follows.

Cook for $\frac{1}{2}$ an hour per kilogram plus 20 minutes

T is the cooking time in minutes.
 m is the mass of the turkey in kilograms.

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

- A** $T = 30m + 20$
- B** $T = 30(m + 20)$
- C** $T = \frac{(m + 20)}{2}$
- D** $T = \frac{1}{2}m + 20$
- 5** You are given that $x = 3$, $y = 7$ and $z = -2$.

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

- A** $y - z = x^2$
- B** $x = y + 2z$
- C** $x + y + 5z = 0$
- D** $y^2 - x^2 = 20z$
- 6** The first four terms of a sequence are $-7, -2, 3, 8$.

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

- A** The next two terms of the sequence are 13 and 18.
- B** 93 is a term of the sequence..
- C** The n th term of the sequence is $5n - 7$.
- D** The 20th term is 50 more than the 10th term.

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

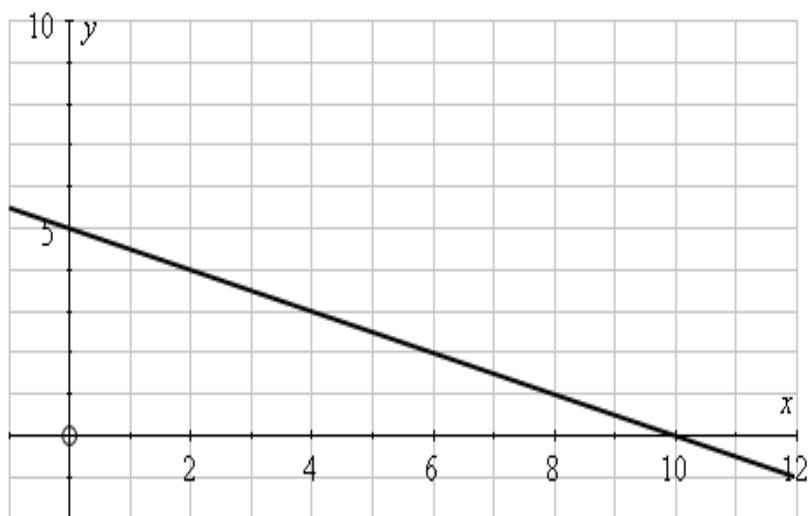
A $x^2 - 9 = (x-3)(x+3)$

B $x^2 - 9x + 20 = (x-4)(x+5)$

C $(2x-3)(x+3) = 2x^2 + 3x - 9$

D $x(x+3) - x(x-3) = 6x$

8 The graph of a line is shown below.



graph of the line $y = 3x - 2$ on the same axis.

Draw the

Which **one** of the following is the point of intersection of these two lines?

A (2,4)

B (4,3)

C (6,2)

D (3,7)

9 Which **one** of the following is the **correct** solution of the inequality $3(x-5) > 2-x$?

A $x > 8\frac{1}{2}$

B $x > 4\frac{1}{4}$

C $x > 3\frac{1}{2}$

D $x > 1\frac{3}{4}$

- 10** Paul is attempting to solve a pair of simultaneous equations. His working is shown in the four steps are shown below, but the final answer is incorrect.

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

Equations: $2x + 3y = 14$ (i)
 $5x - 4y = 7$ (ii)

- A** Multiply (i) by 4 and (ii) by 3

$$8x + 12y = 42 \quad (\text{iii})$$
$$15x - 12y = 21 \quad (\text{iv})$$

- B** Subtract (iv) from (iii)

$$-7x = 21 \quad (\text{v})$$

- C** Divide both sides of (v) by -7 :

$$x = -3$$

- D** Substitute this value of x into (i) to give the answer for y

$$-6 + 3y = 14 \text{ gives } y = \frac{20}{3}$$