Revision F4 (Topics 11-16) [51]

1.

(a) p is an odd number.

Is $2p + 1$ an odd number, an even number or could it be either?
Tick the correct box.

☐ odd ☐ even ☐ either

(1)

(b) The nth term of a sequence is $4n + 1$

(i) Write down the first **three** terms of the sequence.

(2)

(ii) Is 122 a term in this sequence?
You **must** explain your answer.

(1)
(Total 4 marks)

2.

60 batteries are tested by putting them into toys and seeing how long they last.

Time, t (minutes)	Frequency
$500 \leq t < 600$	8
$600 \leq t < 700$	15
$700 \leq t < 750$	10
$750 \leq t < 950$	18
$950 \leq t < 1150$	9

(a) Draw a histogram to show this information. **(3)**

(b) Use your histogram, or otherwise, to estimate the median life of a battery. **(2)**
(Total 5 marks)

3.

$y = 6x^4 + 7x^2$ and $x = \sqrt{w+1}$.

Find the value of w when $y = 10$.
Show your working.

(Total 6 marks)

4.

(a) Factorise $r^6 - 3r^4$

(1)

(b) (i) Factorise $x^2 + 5x - 14$

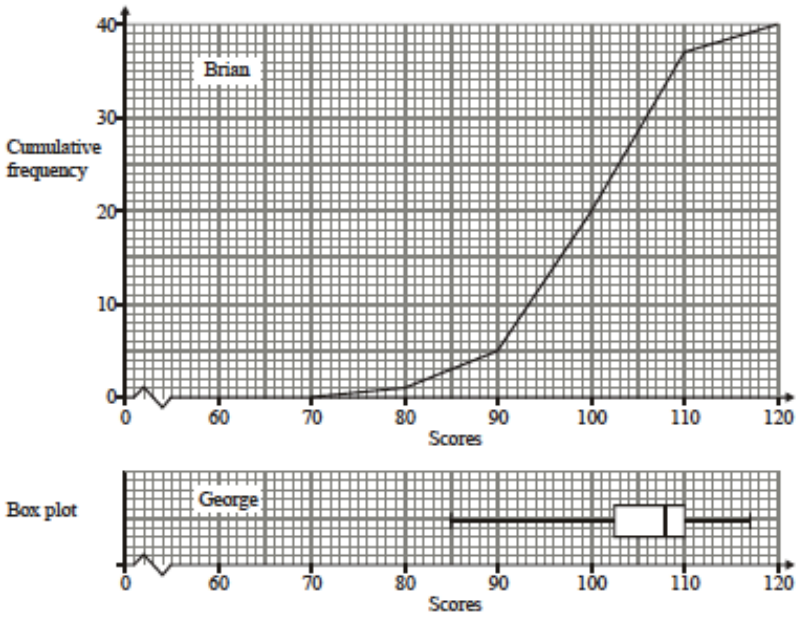
(2)

(ii) Hence solve the equation $x^2 + 5x - 14 = 0$

(1)
(Total 4 marks)

5.

Brian and George played 40 games of golf. The cumulative frequency diagram shows information about Brian's scores. The box plot shows information about George's scores.



(a) Showing your method clearly, find

(i) Brian's median score. **(1)**

(ii) Brian's inter-quartile range. **(2)**

(b) Use the cumulative frequency diagram and the box plot to answer the following.

(i) Which player is the more consistent in his scoring? Give a reason for your choice. **(1)**

(ii) The winner of a game of golf is the player who has the lowest score.
Who do you think is the better player? Give a reason for your choice. **(1)**

(Total 5 marks)

6.

(a) Factorise $7x + 14$

(1)

(b) Expand and simplify $4(m + 3) + 3(2m - 5)$

(2)

(c) Solve the simultaneous equations:

$$2x + 3y = 9$$
$$3x + 2y = 1$$

You **must** show all your working.
Do **not** use trial and improvement.

(4)

(d) Factorise $x^2 + 6x - 16$

(2)

(Total 9 marks)

7. **Non-calculator**

Catrina plays a game throwing both a fair six-sided dice and a fair coin.

She wins a prize when the dice shows a 6 and the coin shows a head.

If Catrina does not win the prize with her first throw, she throws both the dice and the coin once more only.

Calculate the probability that Catrina wins a prize.

(Total 6 marks)

8.

Work out the formula for the n-th term of the sequence: 6, 10, 16, 24, …

(Total 4 marks)

9.

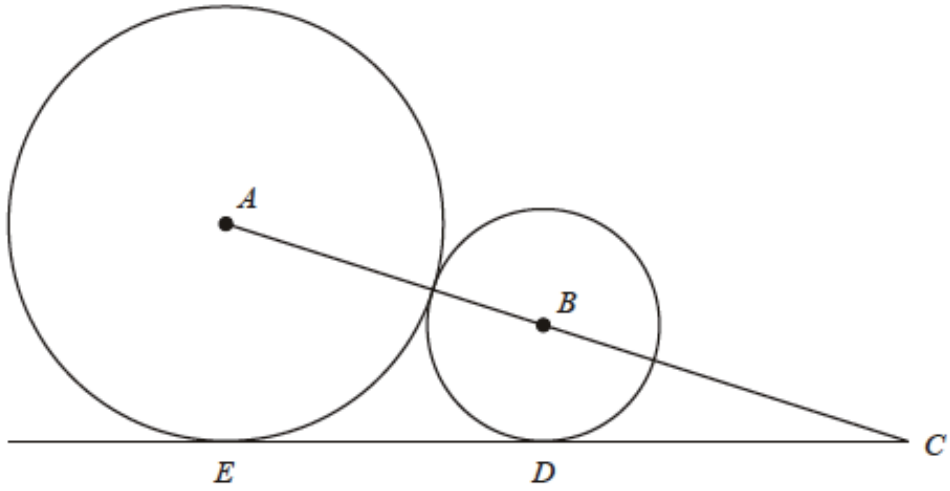
Some students do an experiment with a bag of 12 coloured counters.
They take three counters from the bag at random, one at a time and without replacement.
They record the colour of each counter and then put the three counters back in the bag.
They repeat this experiment 1000 times.

They find that the frequency of taking 3 red counters from the bag is 16.
Show that 4 is a good estimate of the most likely number of red counters in the bag.

(Total 4 marks)

10.

Two circles, centres A and B, with radii 4 cm and 1 cm touch each other.
ABC is a straight line.
EDC is a common tangent to the circles.



Not drawn accurately

Calculate the length AC.

(Total 4 marks)