

<b>Name</b> _____	<b>Class</b> _____
_____	<b>Date</b> _____

### Materials

For this paper you must have:

- The booklet of formulae and statistical tables
- You may use a graphics calculator.

### Instructions

- Use black ink or black ball-point pen. Pencil should be used for drawing.
- Answer **all** questions.
- You must answer each question in the space provided for that question. If you require extra space, use a supplementary answer book; do **not** use the space provided for a different question.
- Do not write outside the box around each page.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- the final answer to questions requiring the use of tables or calculators should normally be given to three significant figures.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.

### Advice

- Unless stated otherwise, you may quote formulae, without proof, from the booklet.
- You do not necessarily have to use all the space provided.

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
<b>Total</b>	

## Section A

Answer **all** questions. Write your answer in the spaces provided.

**1** A bag contains 5 red balls and 7 yellow balls. Two balls are drawn from the bag without replacement.

**a** Draw a tree diagram to illustrate this situation.

**[2 marks]**

**b** Find the probability that the two balls are different colours.

**[3 marks]**

---

---

---

---

---

---

---

---

---

---

**c** A third ball is drawn. Find the probability that all three balls are the same colour.

**[3 marks]**

---

---

---

---

---

---

---

---

---

---

- 2 The table shows the daily maximum temperatures recorded at Heathrow during the month of June in 1987

Date	Daily maximum temperature (°C) in 1987
June 1 <sup>st</sup>	20.5
June 2 <sup>nd</sup>	15.5
June 3 <sup>rd</sup>	19.0
June 4 <sup>th</sup>	19.1
June 5 <sup>th</sup>	15.6
June 6 <sup>th</sup>	18.3
June 7 <sup>th</sup>	16.7
June 8 <sup>th</sup>	14.2
June 9 <sup>th</sup>	13.4
June 10 <sup>th</sup>	17.3
June 11 <sup>th</sup>	17.2
June 12 <sup>th</sup>	18.2
June 13 <sup>th</sup>	17.1
June 14 <sup>th</sup>	17.9
June 15 <sup>th</sup>	18.0
June 16 <sup>th</sup>	16.5
June 17 <sup>th</sup>	16.2
June 18 <sup>th</sup>	18.2
June 19 <sup>th</sup>	16.2
June 20 <sup>th</sup>	20.0
June 21 <sup>st</sup>	19.7
June 22 <sup>nd</sup>	15.9
June 23 <sup>rd</sup>	19.6
June 24 <sup>th</sup>	19.1
June 25 <sup>th</sup>	17.6
June 26 <sup>th</sup>	21.3
June 27 <sup>th</sup>	22.1
June 28 <sup>th</sup>	25.1
June 29 <sup>th</sup>	28.5
June 30 <sup>th</sup>	24.4

- a Calculate the mean and standard deviation for the daily maximum temperatures recorded at Heathrow in June 1987

[2 marks]

---

---

---

---

---

---

---

---

---

---



**3 a** A set of 5 pieces of data has variance 6.64. If  $\sum x = 43$ , work out  $\sum x^2$  **[2 marks]**

---

---

---

---

---

A different set of 5 pieces of data is coded using the formula  $y = 10x - 50$  and the coded values have variance 458.8

**b** Work out the variance of the  $x$ -values in this set, hence compare this data with the set in part **a**. **[3 marks]**

---

---

---

---

---

**Turn over for the next question**





## Section B

Answer **all** questions in the spaces provided

**5** A stone is dropped vertically from a height of 30 m above the ground. Assume  $g = 9.81 \text{ m s}^{-2}$

**a** How long does it take for the stone to reach the ground? **[2 marks]**

---

---

---

---

**b** With what velocity does the stone hit the ground? **[2 marks]**

---

---

---

---

**c** State an assumption you have made. **[1 mark]**

---

---

---

---

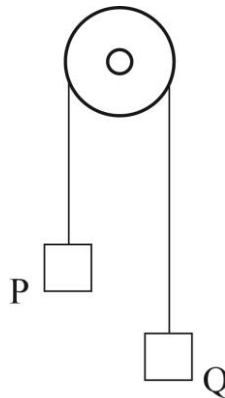
**Turn over for the next question**







- 8** Two particles, P and Q, are connected by a light inextensible string and pass over a smooth pulley as shown in the diagram.



The mass of particle P is 2 kg and the mass of particle Q is 7 kg

- a** The system is released from rest. Work out the magnitude and direction of the acceleration and the tension in the string. You may assume that  $g = 10 \text{ m s}^{-2}$  **[5 marks]**

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

- b** State the significance of the string being inextensible. **[1 mark]**

---

---

---

