

KINROSS HIGH SCHOOL

Prelim Examination

January 2014

National 5

Lifeskills Mathematics

Paper 1

Duration: 50 minutes

Fill in these boxes and read what is printed below.

Forename(s)

Surname

Number of seat

Total marks — 35

You may **NOT** use a calculator.

Attempt ALL questions.

Use **blue** or **black** ink. Pencil may be used for graphs and diagrams only.

Write your working and answers in the spaces provided. Additional blank paper and square-ruled paper is available should you require it. If you use additional paper, write your name and the number of the question clearly on it.

Full credit will be given only to solutions which contain appropriate working. State the units for your answer where appropriate.

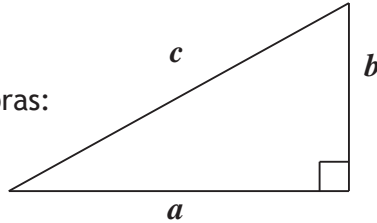
Before leaving the examination room you must give this booklet to the Invigilator. If you do not, you may lose all the marks for this paper.

FORMULAE LIST

Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Volume of a cylinder: $V = \pi r^2 h$

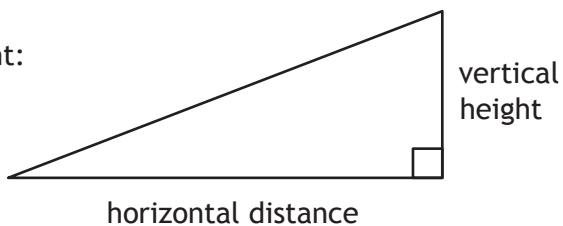
Volume of a prism: $V = Ah$

Volume of a cone: $V = \frac{1}{3} \pi r^2 h$

Volume of a sphere: $V = \frac{4}{3} \pi r^3$

Standard deviation: $s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$, where n is the sample size.

Gradient:



$$\text{gradient} = \text{vertical height} / \text{horizontal distance}$$

Attempt ALL questions

1. In an election for School President, Jonah and Roberta each received more votes than Marcus. Jonah and Roberta polled $\frac{4}{11}$ and $\frac{2}{5}$ of the votes respectively.



- (a) Who won the election?

You must give a reason for your answer.

2

- (b) If 1100 pupils voted in the election, how many votes did Marcus poll?

2

2. Stuart was flying from London Heathrow to Hong Kong to visit an old school friend. His flight left at 2150. The plane travelled at an average speed of 900km/hr. The distance from London to Hong Kong is 9450km. If Hong Kong is 8 hours ahead of London, when did his plane arrive in Hong Kong?



3. A school enterprise group had a craft stall at the Kinross Better Place to Live Fair. The materials for the crafts amounted to £25 and the group had to pay £10 to Kinross Community Council for the stall. Their sales for the day totalled £140.

(a) The group agreed to donate 40% of their net profit to Mary's Meals.
What was left after they made this donation?

2

(b) Express this amount as a percentage of the total sales.

2

4. Samantha has been working in a hairdressing salon as a junior. Her employer has agreed to let her to let her attend college on day release to get a formal qualification in hairdressing.

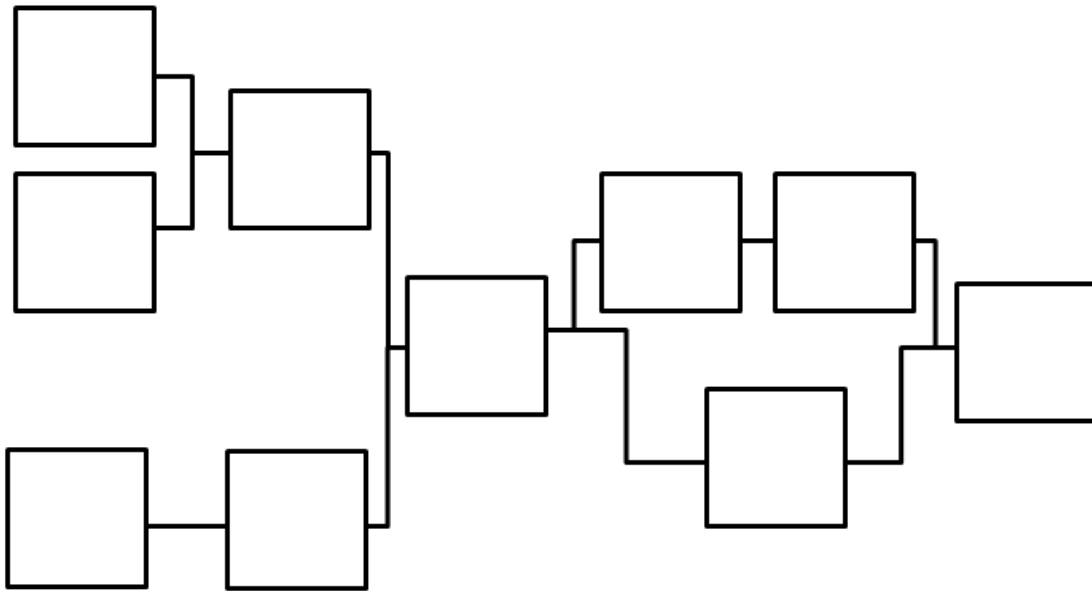
In order to achieve this she needs to complete a series of different modules. These are shown in the table below:

Module Code	Module Title	Preceding Task	Length (weeks)
A	Communication	None	6
B	Numeracy for business	None	8
C	Fundamental chemistry	B	6
D	Styling Hair	None	6
E	Cutting Hair	D	10
F	Assessment 1	A,B,C,D,E	1
G	Colouring Hair	F	5
H	Permanent Waves	G	4
I	Being your own boss	F	6
J	Assessment 2	G,H,I	1

4. (continued)

(a) Complete the chart below, by writing the module code and the time (in weeks) in the boxes.

2



(b) Calculate the minimum number of weeks Samantha will take to finish the course.

1

5. Fifteen pupils trained for the 100m sprint for KHS Sports Day.

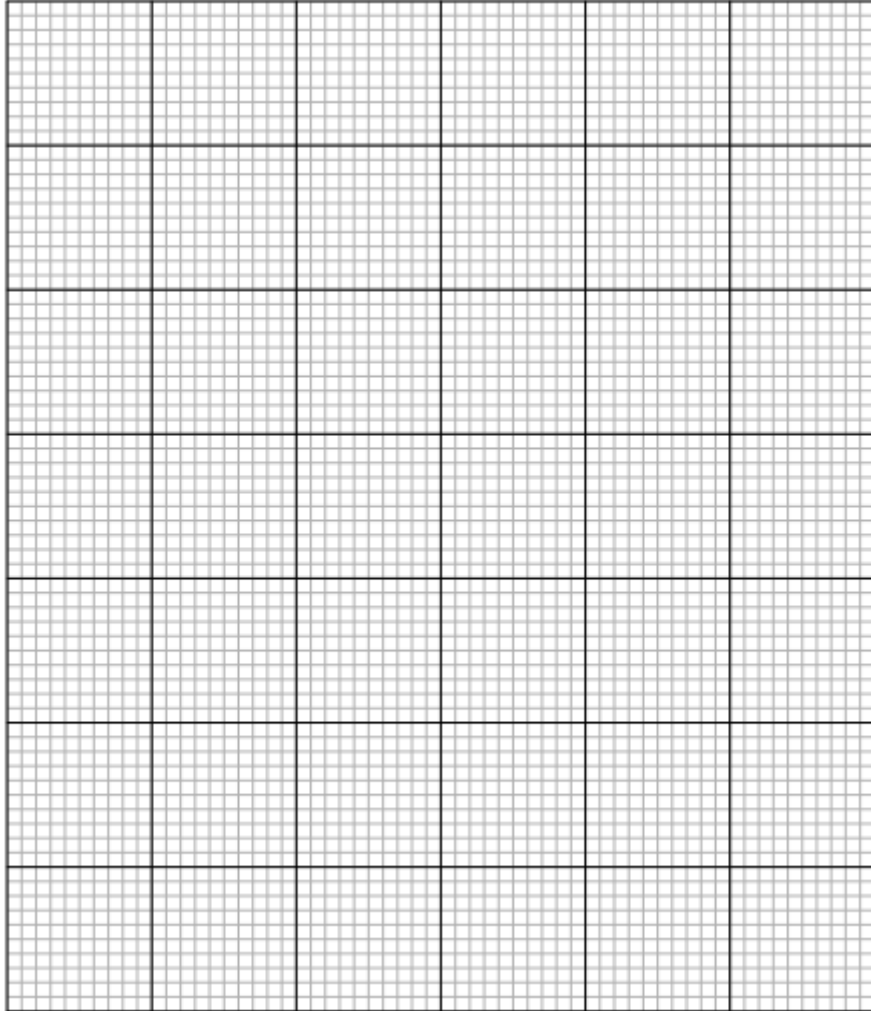
Some of them took their training more seriously than others. The following table gives the number of days training and the times taken to run 100m at Sports Day.

Name	Number of days training	Time to complete 100 m in seconds
Albert	100	10.2
Beth	90	11.7
Cindy	20	13.9
David	50	14.3
Emily	10	17.0
Frank	20	16.5
Gary	10	18.4
Helen	60	11.3
Ida	60	12.7
Jeremy	60	13.1
Kyle	10	19.6
Lewis	30	17.2
Mary	70	13.1
Naomi	30	14.3
Oscar	50	12.9

5. (continued)

(a) Plot this data, as a scatter graph, on the grid below

2



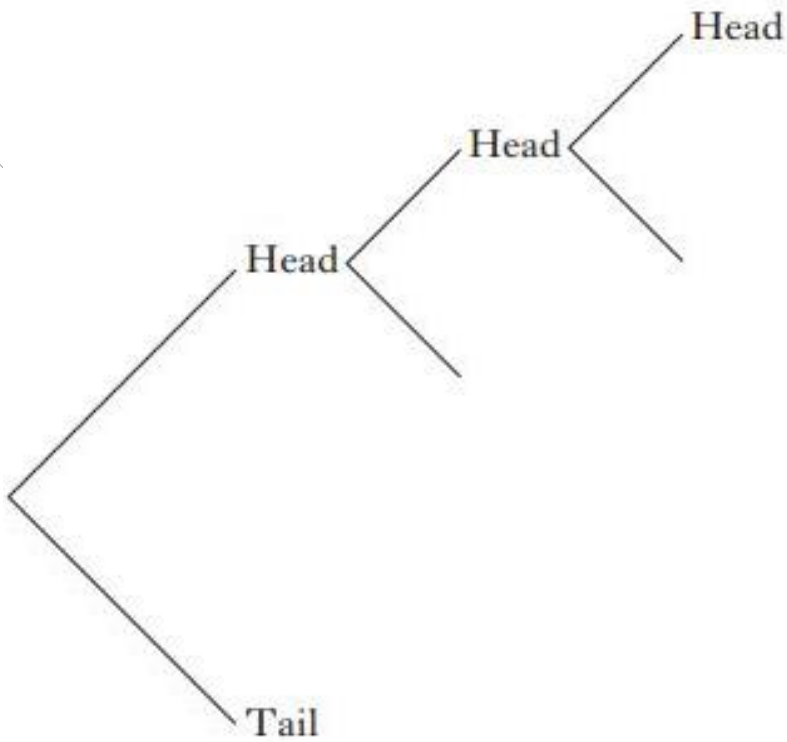
(b) Draw a line of best fit on the diagram above.

1

(b) A new pupil moved to KHS just before Sports Day. His time was for the 100m was 13.5 seconds. Use your line of best fit to estimate the number of days training he did.

1

6. Anna tosses a coin three times.



(a) Extend the above tree diagram to show all the possible results.

3

(b) What is the probability that, out of three tosses, she gets exactly one tail?

1

7. Matthew earns £34 500 per annum.

This year, he is entitled to a personal tax allowance of £9440 and he pays tax at the basic rate of 20%.



(a) Calculate how much tax he must pay this year.

2

(b) Matthew also pays £267.52 per month in National Insurance and £150 per month into his company's Share Save Scheme.

(i) Calculate Matthew's total monthly deductions.

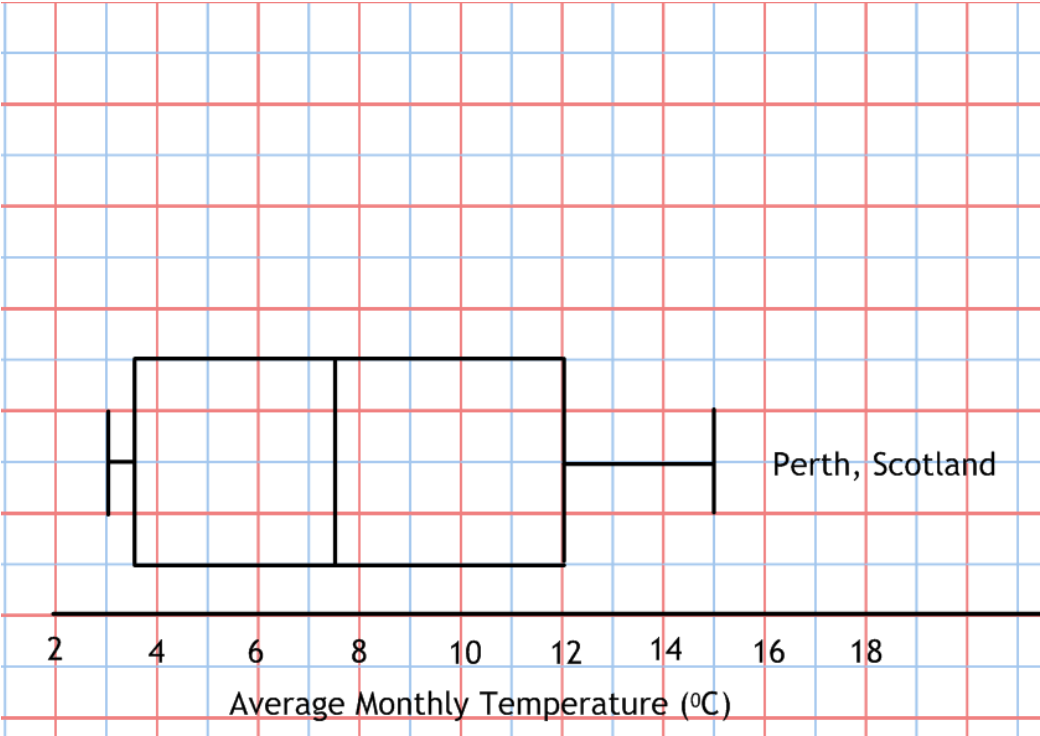
2

(ii) Calculate Matthew's monthly take home pay.

1

8. The boxplot below has been constructed using the average daily temperature for each month of the year for Perth.

(Source: www.weatherbase.com)



The corresponding data for San Francisco, California is below:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	11	12	13	13	14	15	15	16	17	16	14	11

8. (continued)

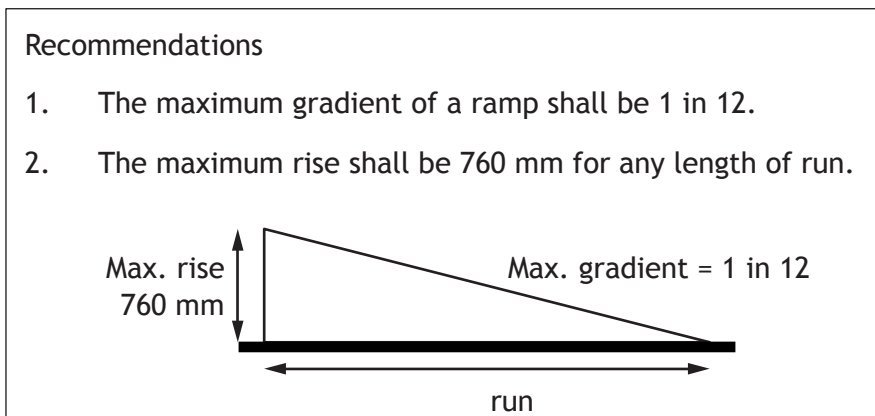
(a) Construct a boxplot above that for Perth to illustrate the data for California.

3

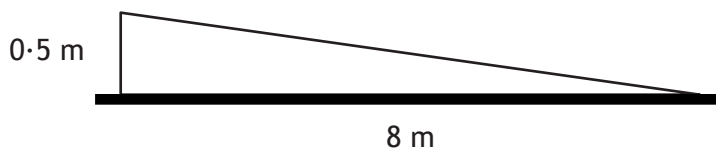
(b) Make two statements comparing the temperatures in Perth and San Francisco.

2

9. The 'Accessibility Guidelines for Buildings and Facilities for Wheelchair Access' give two recommendations.



The drawing below shows the design of a new ramp.



- (a) Does the new ramp meet Recommendation 1?

Give a reason.

2

- (b) Does the new ramp meet Recommendation 2?

Give a reason.

1

[END OF QUESTION PAPER]