2500/31/01

NATIONAL FRIDAY, 3 MAY QUALIFICATIONS 1.30 PM - 2.25 PM 2013 MATHEMATICS STANDARD GRADE Credit Level Paper 1 (Non-calculator)

1 You may NOT use a calculator.

- 2 Answer as many questions as you can.
- 3 Full credit will be given only where the solution contains appropriate working.
- 4 Square-ruled paper is provided inside your answer booklet.

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





FORMULAE LIST

The roots of
$$ax^2 + bx + c = 0$$
 are $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$ or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Area of a triangle: Area = $\frac{1}{2}ab \sin C$

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

1. Evaluate

 $86 \cdot 5 - 3 \cdot 651 \times 20.$

2. Evaluate

$$\frac{1}{2} \div 2\frac{2}{3}.$$

A group of people attended a course to help them stop smoking.
The following table shows the statistics before and after the course.

	Mean number of cigarettes smoked per person per day	Standard deviation
Before	20.8	8.5
After	9.6	12.0

Make **two** valid comments about these results.

4. Change the subject of the formula to *r*.

 $A=4\pi r^2.$

[Turn over

2

2

KU RE

2

2

5. 150 patients have been given a flu vaccine.

The data is shown in the table below.

ACE	GENDER	
AGE	male	female
5 or under	4	3
6 - 15	7	8
16 - 59	37	47
60 or over	12	32

What is the probability that

- (a) a patient given the flu vaccine was male **and** aged 60 or over?
- (b) a patient given the flu vaccine was aged 5 or under?
- 6. Joan buys gold and silver charms to make bracelets.2 gold charms and 5 silver charms cost £125.
 - (a) Let g pounds be the cost of one gold charm and s pounds be the cost of one silver charm.

Write down an equation in terms of g and s to illustrate the above information.

4 gold charms and 3 silver charms cost \pounds 145.

- (b) Write down another equation in terms of g and s to illustrate this information.
- (*c*) Hence calculate the cost of each type of charm.

3

KU RE

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1

1

1

7. (*a*) Expand and simplify

$$(2x-5)(x^2+3x-7).$$

(*b*) Solve the inequality

$$4x - 5 \le 7x - 20.$$

8. Four straight line graphs are shown below.



Which one of these above could represent the line with equation 2x + y = 3? Give two reasons to justify your answer.

3

KU RE

3

3

Page five



10. The parabola with equation $y = x^2 - 2x - 3$ cuts the x-axis at the points A and B as shown in the diagram.



- (a) Find the coordinates of A and B.
- (b) Write down the equation of the axis of symmetry of $y = x^2 2x 3$.

1

4

I1. Jenny is doing calculations using consecutive numbers.
She notices a pattern which always gives an answer of 1.
Using 2, 3, 4 gives $3^2 - 2 \times 4 = 1$.
3, 4, 5 gives $4^2 - 3 \times 5 = 1$.
4, 5, 6 gives $5^2 - 4 \times 6 = 1$.KU RE(a) Using 8, 9, 10, write down a similar pattern.
(b) Using n, (n+1), (n+2), show that the answer is 1 for any three
consecutive numbers.133

[END OF QUESTION PAPER]