

# 2500/31/01

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NATIONAL  
QUALIFICATIONS  
2013

FRIDAY, 3 MAY  
1.30 PM – 2.25 PM

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:**  $\text{Area} = \frac{1}{2} ab \sin C$

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

1. Evaluate

$$86.5 - 3.651 \times 20.$$

KU RE

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2. Evaluate

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

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.

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

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

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

$$A = 4\pi r^2.$$

2

[Turn over



7. (a) Expand and simplify

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

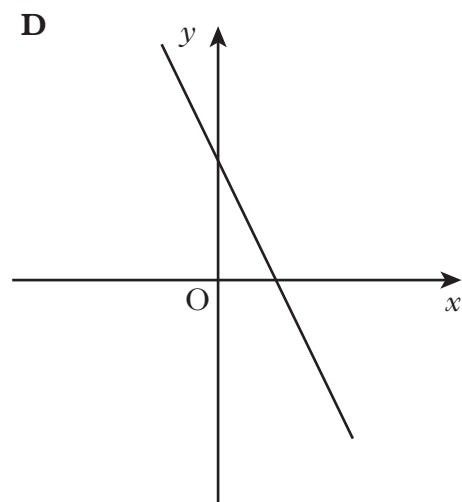
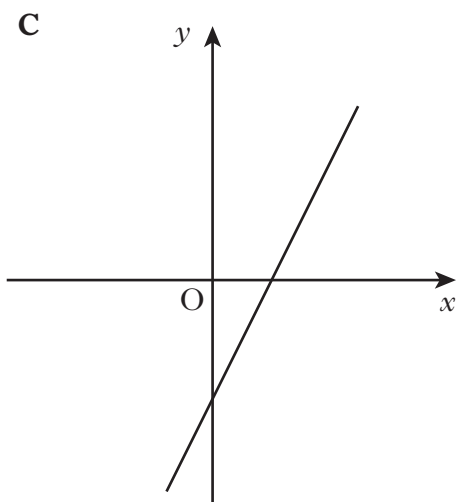
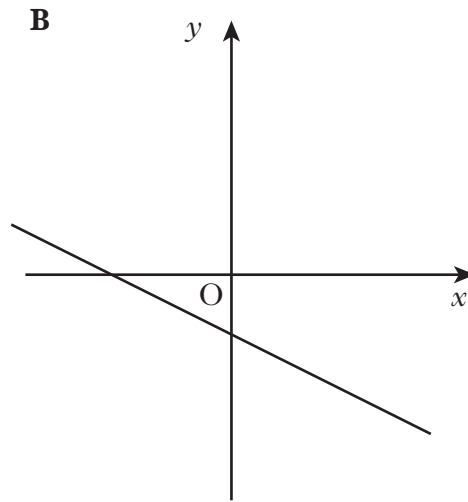
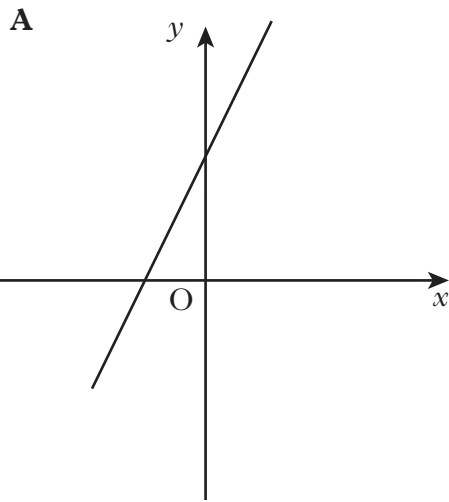
(b) Solve the inequality

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

3

3

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
<b>1</b>	<b>3</b>

**11.** 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  $5^2 - 4 \times 6 = 1$ .

(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.

*[END OF QUESTION PAPER]*

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