Dr Oliver Mathematics
Mathematics Standard Grade: Credit Level
2013 Paper 1: Non-Calculator
55 minutes

The total number of marks available is 38.
You must write down all the stages in your working.

1. Evaluate (2)

$$86.5 - 3.651 \times 20.$$

2. Evaluate (2)

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

3. A group of people attended a course to help them stop smoking. (2)
The following table shows the statistics before and after the course.

	Mean number of cigarettes	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: (2)

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

5. 150 patients have been given a flu vaccine.
The data is shown in the table below.

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? (1)

(b) a patient given the flu vaccine was aged 5 or under? (1)

6. Joan buys gold and silver charms to make bracelets.
2 gold charms and 5 silver charms cost £125.

Let g pounds be the cost of one gold charm and s pounds be the cost of one silver charm.

(a) Write down an equation in terms of g and s to illustrate the above information. (1)

4 gold charms and 3 silver charms cost £145.

(b) Write down another equation in terms of g and s to illustrate this information. (1)

(c) Hence calculate the cost of each type of charm. (3)

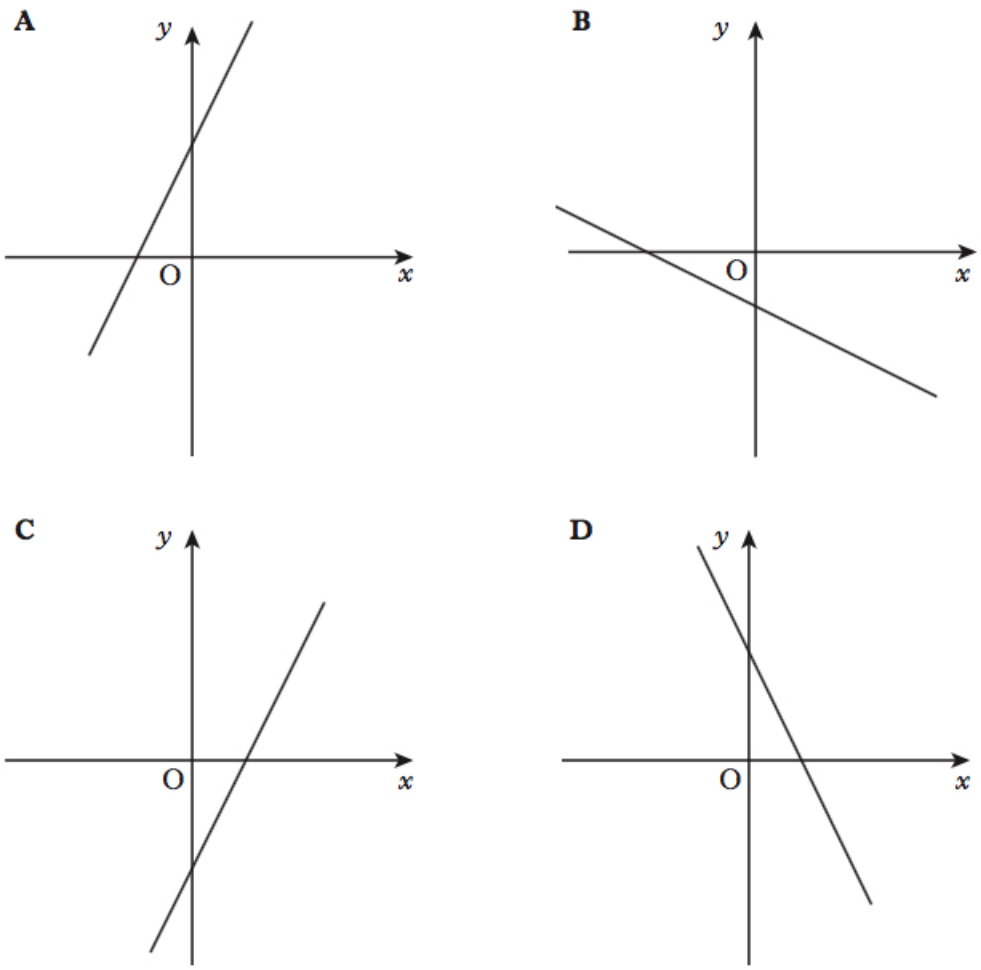
7. (a) Expand and simplify (3)

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

(b) Solve the inequality (3)

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

8. Four straight line graphs are shown below. (3)



Which one of these above could represent the line with equation

$$2x + y = 3?$$

Give **two** reasons to justify your answer.

9. Quick-Smile photographers charge the following rates:

   - 50p per photograph for the first 12 photographs printed,
   - 35p per photograph for any further photographs printed, and
   - £4.25 for a CD of the photographs.

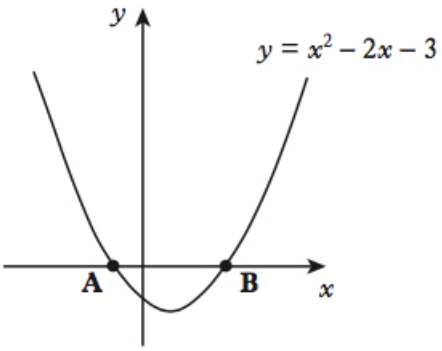
   (a) How much will it cost to have 16 photographs printed plus a CD? (2)

   (b) Find a formula for C, the cost in pounds, of having x photographs printed (where x is greater than 12) plus a CD. (3)

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. (4)

(b) Write down the equation of the axis of symmetry of (1)

$$y = x^2 - 2x - 3.$$

11. Jenny is doing calculations using consecutive numbers.
She notices a pattern which always gives an answer of 1.
Using

$$2, 3, \text{ and } 4 \text{ gives } 3^2 - 2 \times 4 = 1.$$
$$3, 4, \text{ and } 5 \text{ gives } 4^2 - 3 \times 5 = 1.$$
$$4, 5, \text{ and } 6 \text{ gives } 5^2 - 4 \times 6 = 1.$$

(a) Using 8, 9, and 10, write down a similar pattern. (1)

(b) Using n, $(n + 1)$, and $(n + 2)$, show that the answer is 1 for any three consecutive numbers. (3)