NON-CALC A

GCSE Mathematics · Higher Tier

40 marks · 45 minutes · Non-calculator

Name ..... **Class** .....

Answer all questions. Show all your working. Diagrams are NOT accurately drawn unless stated.

1 **(a)** Write 252 as a product of its prime factors.

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(2)

(b) Find the highest common factor (HCF) of 252 and 120.

.....

(1)

(Total for Question 1 is 3 marks)

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2 A bag contains only red, blue and green counters.

The numbers of red, blue and green counters are in the ratio 3 : 5 : 4

There are 18 more blue counters than red counters in the bag.

Work out the number of green counters in the bag.

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(Total for Question 2 is 3 marks)

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3 The table gives information about the times, in minutes, that 20 people waited at a bus stop.

Time (t minutes)	Frequency
$0 < t \leqslant 10$	4
$10 < t \leqslant 20$	9
$20 < t \leqslant 30$	5
$30 < t \leqslant 40$	2

(a) Work out an estimate for the mean time.

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(3)

(b) Explain why your answer to part (a) is an estimate.

.....

(1)

(Total for Question 3 is 4 marks)

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4 **(a)** Expand and simplify $(2x - 3)(x + 5)$

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(2)

(b) Factorise $x^2 - 3x - 28$

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(2)

(Total for Question 4 is 4 marks)

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5 The size of each interior angle of a regular polygon is 7 times the size of each exterior angle.

Work out the number of sides of the polygon.

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(Total for Question 5 is 3 marks)

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6 Solve the simultaneous equations

$$3x + 2y = 4$$
$$5x - 3y = 13$$

$x =$ ..... $y =$ .....

(Total for Question 6 is 3 marks)

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7 A box contains 4 red pens and 6 blue pens only.

Sam takes two pens at random from the box without replacement.

Sam says,

"The probability that both pens are the same colour is more than one half."

Is Sam correct? You must show how you get your answer.

(Total for Question 7 is 3 marks)

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8 Work out the value of $64^{-\frac{2}{3}}$

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(Total for Question 8 is 2 marks)

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9 A sector of a circle has radius 6 cm and angle 120°.

Work out the area of the sector.

Give your answer in terms of π.

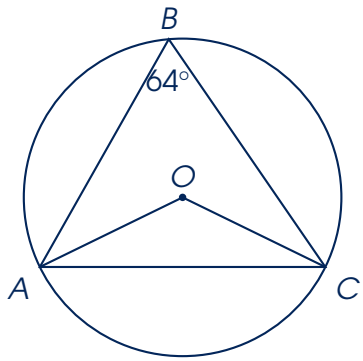
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(Total for Question 9 is 2 marks)

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10 A, B and C are points on a circle, centre O.

Angle $ABC = 64°$



Work out the size of angle OAC.

Give a reason for each stage of your working.

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(Total for Question 10 is 3 marks)

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11 The line **L** passes through the points $(-1,\ 7)$ and $(3,\ -1)$

The line **M** is perpendicular to **L** and passes through the point $(4,\ 5)$

Find an equation of the line **M**.

Give your answer in the form $y = mx + c$

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(Total for Question 11 is 4 marks)

12 Prove algebraically that the difference between the squares of any two consecutive odd numbers is always a multiple of 8

(Total for Question 12 is 3 marks)

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13 Two solids, **P** and **Q**, are mathematically similar.

The surface area of **P** is 18 cm^2. The surface area of **Q** is 50 cm^2.

The volume of **Q** is 375 cm^3.

Work out the volume of **P**.

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(Total for Question 13 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS