

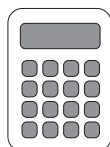
SET A – Paper 3 Foundation Tier (Calculator)

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Time allowed: 1 hour 30 minutes

You must have:

- Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator



Instructions

- Use **black** ink or black ball-point pen.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Name:

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages of your working.

- 1** Write 31 505 correct to the nearest 1000.

.....
(Total for Question 1 is 1 mark)

- 2** From the following list of numbers, write down the square number, and write down the prime number.

45, 46, 47, 48, 49, 50

Square number is

Prime number is

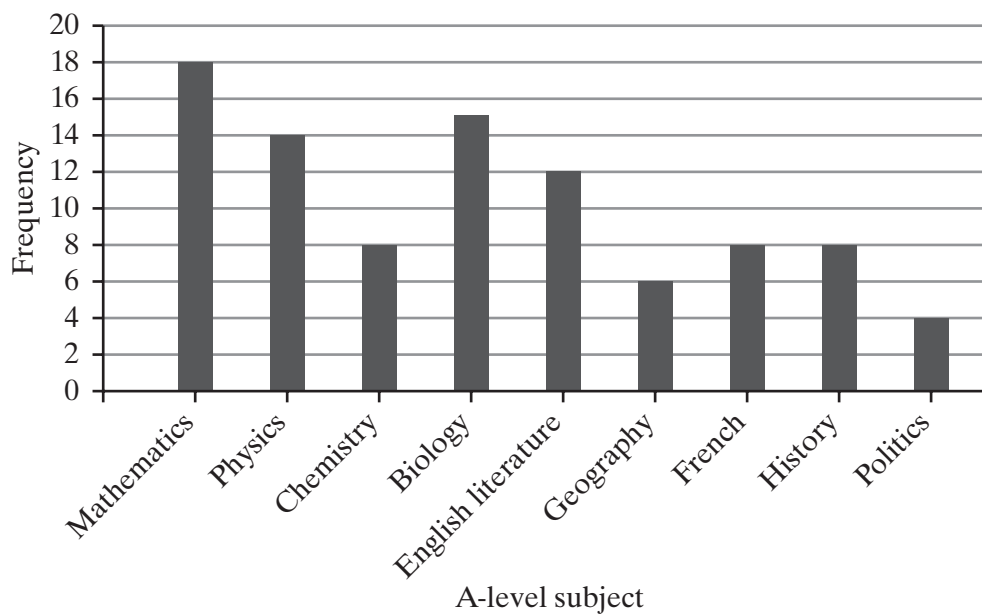
(Total for Question 2 is 2 marks)

- 3** The distance between Newcastle and Carlisle is 84.65 km

Given that a road atlas has a scale of 1:625 000, calculate the distance that Newcastle and Carlisle would be apart in the atlas.

.....
(Total for Question 3 is 3 marks)

- 4 The following bar chart illustrates the number of students choosing each subject at the start of their A-level courses.



- (a) Find the percentage of students who choose either English literature or Mathematics.

(2)

- (b) State the modal subject choice.

(1)

(Total for Question 4 is 3 marks)

5 Tom is thinking about buying a season ticket to attend home matches at his local football club.

The price of entry to a single match is £17, while a season ticket costs £300.

(a) How many matches would Tom need to attend in order for the season ticket to save him money?

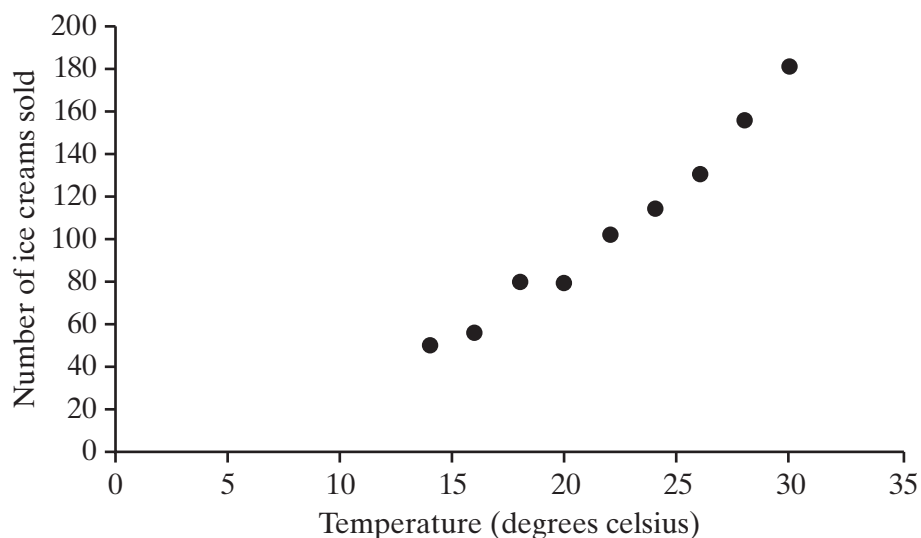
.....
(2)

(b) Given that there are 21 home matches in the season, how much would Tom save if he bought a season ticket and attended all matches?

.....
(2)

(Total for Question 5 is 4 marks)

- 6 The following is a scatter-diagram showing the relationship between the number of ice creams sold per day and the average temperature.



- (a) Describe the relationship between the number of ice creams sold and the temperature.

(1)

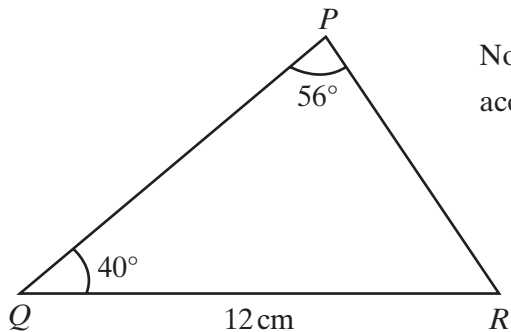
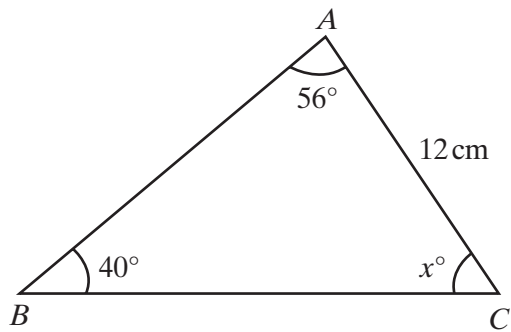
- (b) By drawing a line of best fit, estimate the number of ice creams that will be sold when the temperature is 8°C .

(2)

- (c) Suggest why it may not be appropriate to draw a line of best fit for this data.

(1)

(Total for Question 6 is 4 marks)



Not drawn accurately

- (a) Calculate the size of the angle marked x .

$x = \dots\dots\dots^\circ$

(2)

- (b) Peter says that these triangles are congruent.

Is he correct?

Give a reason for your answer.

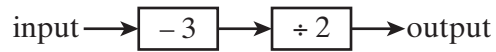
.....

.....

(2)

(Total for Question 7 is 4 marks)

8 Consider the following number machine.



(a) Find the value of the output when the input is 99.

(1)

(b) Find the value of the input, if the output is twice its value.

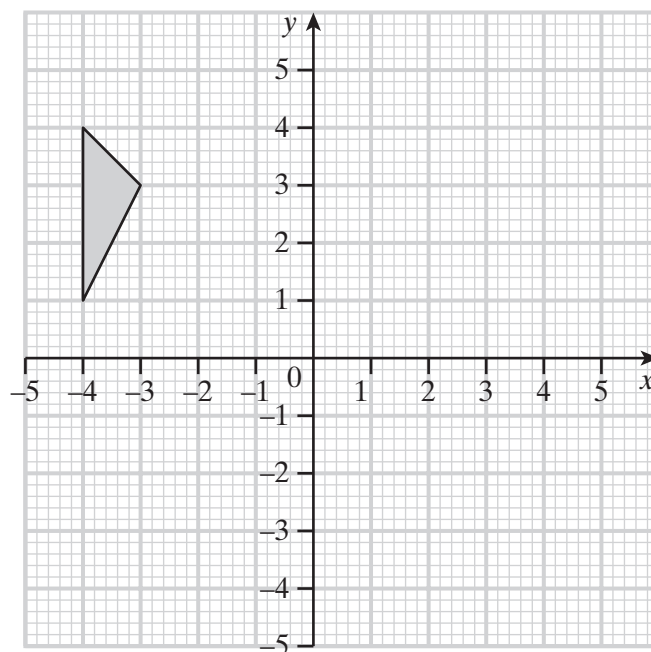
(2)

(Total for Question 8 is 3 marks)

9 List the possible values of n if n is an integer and $-7 \leq n < 3$

(Total for Question 9 is 1 mark)

- 10** Translate the following triangle by the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$



(Total for Question 10 is 2 marks)

- 11** (a) Simplify $5x - 3y + 4x + y$

(1)

- (b) Simplify $(3x)^2$

(1)

(Total for Question 11 is 2 marks)

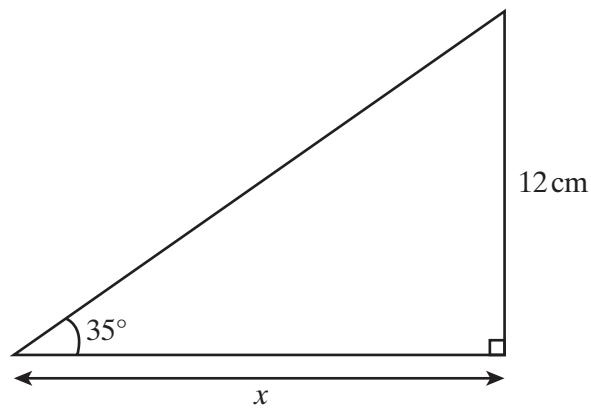
- 12** A motorcyclist travels at a steady speed of 15 m/s.

Calculate his speed in km/hr.

..... km/hr

(Total for Question 12 is 2 marks)

- 13** Find the length of the side marked x in the following right-angled triangle.



Not drawn
accurately

$x =$ cm

(Total for Question 13 is 2 marks)

14 State which of the following are equations, and which are identities.

Give your reasons.

(a) $(x - 3)^2 = x^2 + 9$

.....
(1)

(b) $\cos x^\circ = \sin x^\circ$

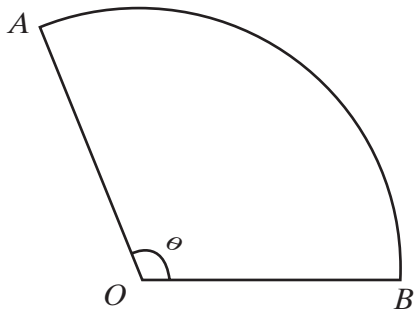
.....
(1)

(c) $x + 1 = \frac{x^2 - 1}{x - 1}$

.....
(1)

(Total for Question 14 is 3 marks)

15 The following sector OAB has a radius of 15 cm and an area of 250 cm^2 .



Find the size of the angle θ .

$\theta =$ ^o

(Total for Question 15 is 2 marks)

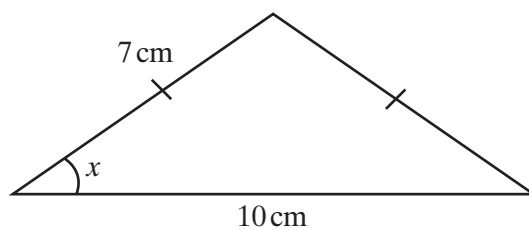
- 16 The density of gold is 19.3 g/cm^3 .

Calculate the mass (in kg) of a 0.1 m^3 block of solid gold.

..... kg

(Total for Question 16 is 3 marks)

- 17 Find the size of the angle marked x in the following diagram.



$x =$ $^{\circ}$

(Total for Question 17 is 3 marks)

- 18 Simplify the expression $10(x - 2) - 2(x - 10)$

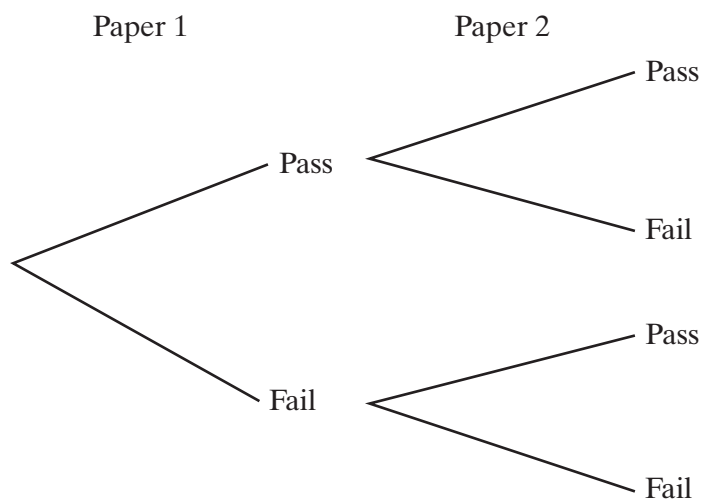
.....
(Total for Question 18 is 3 marks)

- 19** A maths test comprises of two papers: paper 1 and paper 2.

A student completes paper 1, then tackles paper 2.

The probability that a student passes paper 1 is 0.7, and the probability that a student passes paper 2 is 0.8

- (a)** Complete the probabilities on the following tree diagram.



(2)

- (b)** Find the probability that the student passes at least one of the papers.

(2)

(Total for Question 19 is 4 marks)

- 20** You are given the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

Calculate the value of f when $u = 3.5$ and $v = 12.2$

(Total for Question 20 is 2 marks)

21 Three apples and two bananas cost 76p.

One apple and one banana cost 32p.

Find the separate cost of each fruit.

Apple = p

Banana = p

(Total for Question 21 is 4 marks)

22 Charlotte has a biased coin.

The probability that she throws a head is 0.6

(a) Charlotte throws the coin twice.

Find the probability that she throws two heads.

.....
(2)

(b) Charlotte throws the coin five times and finds she has thrown all heads.

What is the probability that she throws a tail on the next occasion?

.....
(1)

(c) Charlotte throws the coin 60 times.

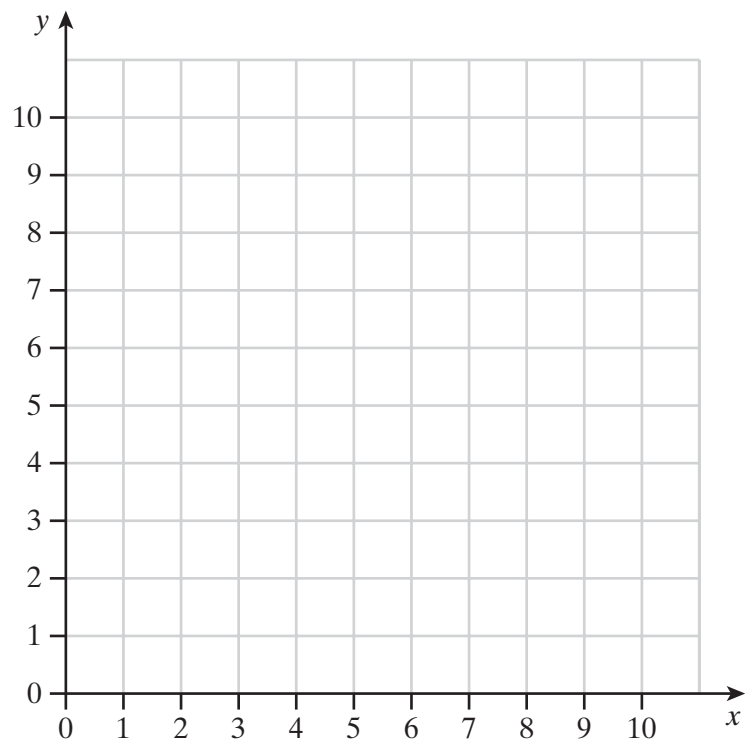
How many times can she expect to throw heads?

.....
(2)

(Total for Question 22 is 5 marks)

23 A triangle has vertices at $A (4, 3)$, $B (7, 3)$ and $C (7, 4)$.

(a) Plot the triangle on the grid below.



(1)

(b) On the grid, draw the line with equation $y = x$

(1)

(c) Reflect the triangle ABC in the line $y = x$

(1)

(Total for Question 23 is 3 marks)

24 Will pays £10 000 for a second-hand car.

Its value depreciates by 16% every year.

Find, by trial and error, how long it will take for the car's value to drop below £5000.

Show your working clearly.

(Total for Question 24 is 3 marks)

25 Simplify the expression $\frac{x^2 + 2x - 3}{x^2 - 9}$

(Total for Question 25 is 4 marks)

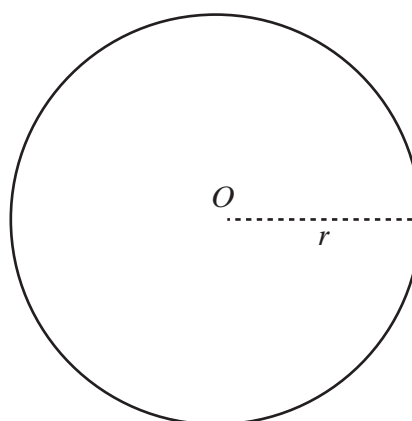
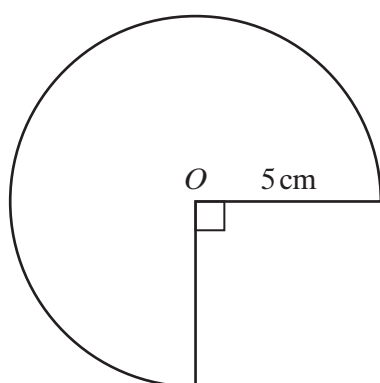
26 A line L has gradient $\frac{4}{5}$ and passes through the point $(0, 2)$.

Find the exact coordinate where L crosses the x -axis.

(Total for Question 26 is 3 marks)

27 The first diagram shows part of a circle, centre O , radius 5 cm.

The second diagram shows a circle, centre O , radius r cm.



Given that both shapes have the same perimeter, calculate the value of r , giving your answer to 3 significant figures.

(Total for Question 27 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS
