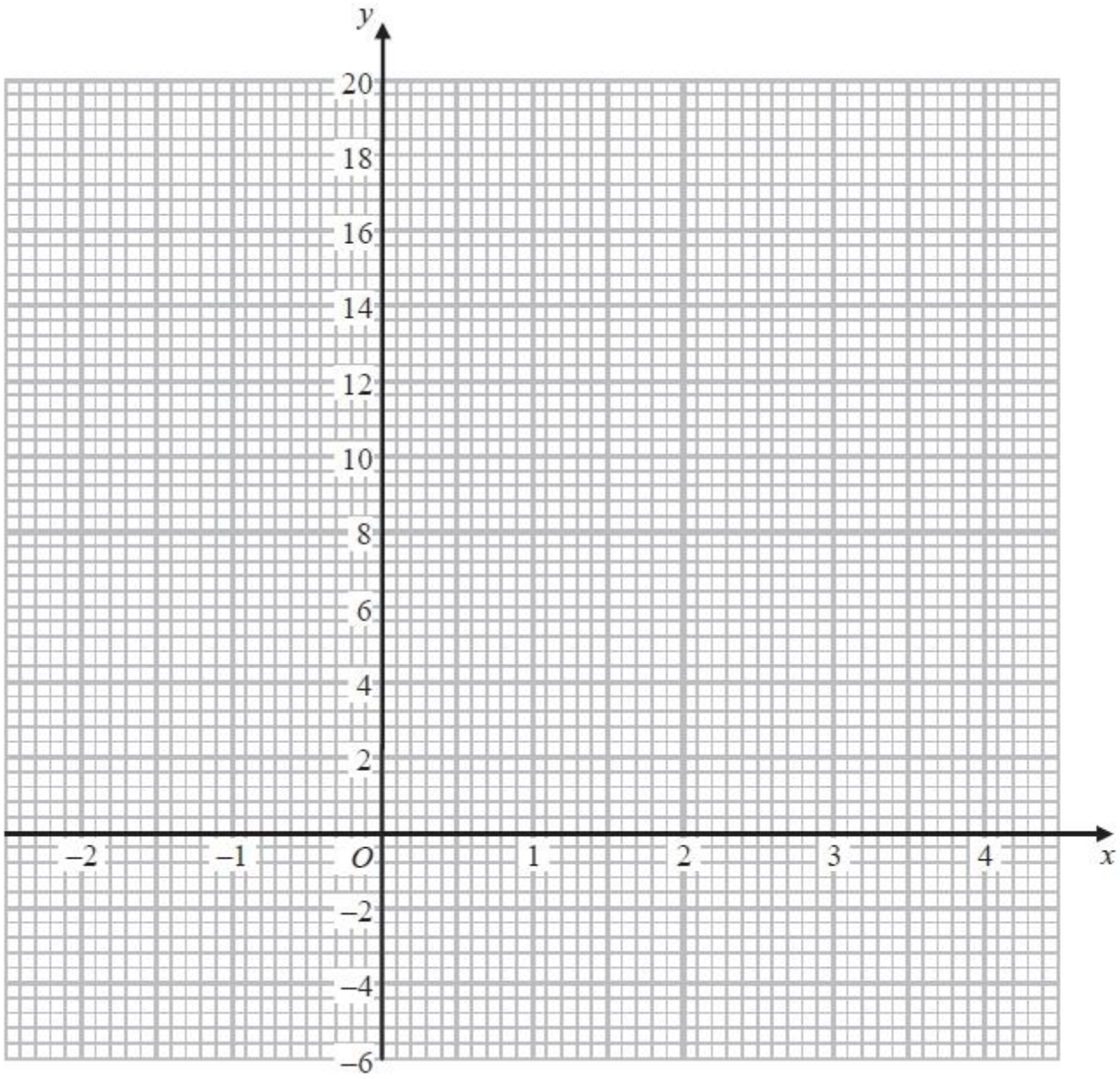
Year 10 Mock Exam – Practice Paper 1

Non-calculator

Q1.

On the grid, draw the graph of $y = 3x + 2$ for values of x from −2 to 4



(Total for question = 4 marks)

Q2.

(a) Complete the table to show each number written correct to 1 significant figure.

Number	42.37	58.92	21.04
Number written correct to 1 significant figure			

(2)

(b) Use the approximations in part (a) to work out an estimate for the value of

$$\frac{42.37 + 58.92}{21.04}$$

Show clearly how you obtain your answer.

.....

(2)

(Total for Question is 4 marks)

Q3.

Work out the area of a quarter circle with diameter 16m, giving your answer in terms of π

.....m

(Total for question = 2 marks)

Q4.

$(a + \sqrt{b})^2 = 49 + 12\sqrt{b}$ where a and b are integers, and b is prime.

Find the value of a and the value of b

a = ...

b = ...

(Total for question = 3 marks)

Q5.

2.2×10^7 passengers passed through Beijing Capital International Airport in 2014.

(a) Write 2.2×10^7 as an ordinary number.

.....

(1)

950 000 tonnes of cargo traffic passed through Tokyo International Airport in 2014.

(b) Write 950 000 as a number in standard form.

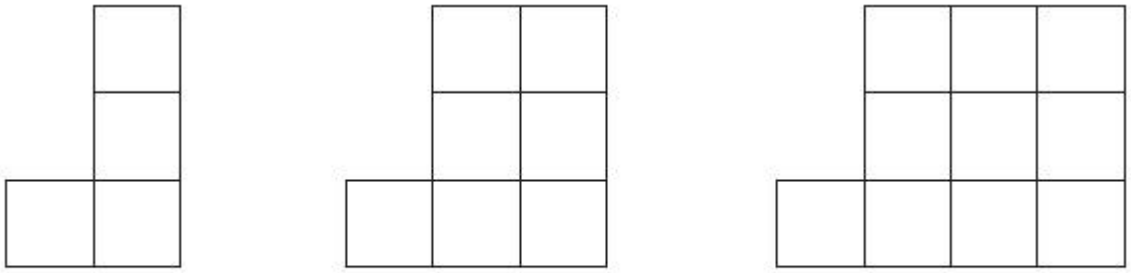
.....

(1)

(Total for question = 2 marks)

Q6.

Here is a sequence of patterns made from centimetre squares.



Pattern number 1

Pattern number 2

Pattern number 3

(a) Find an expression, in terms of *n*, for the total number of centimetre squares in Pattern number *n*.

.....

(2)

A pattern in this sequence has 88 centimetre squares.

(b) Work out the Pattern number of this pattern.

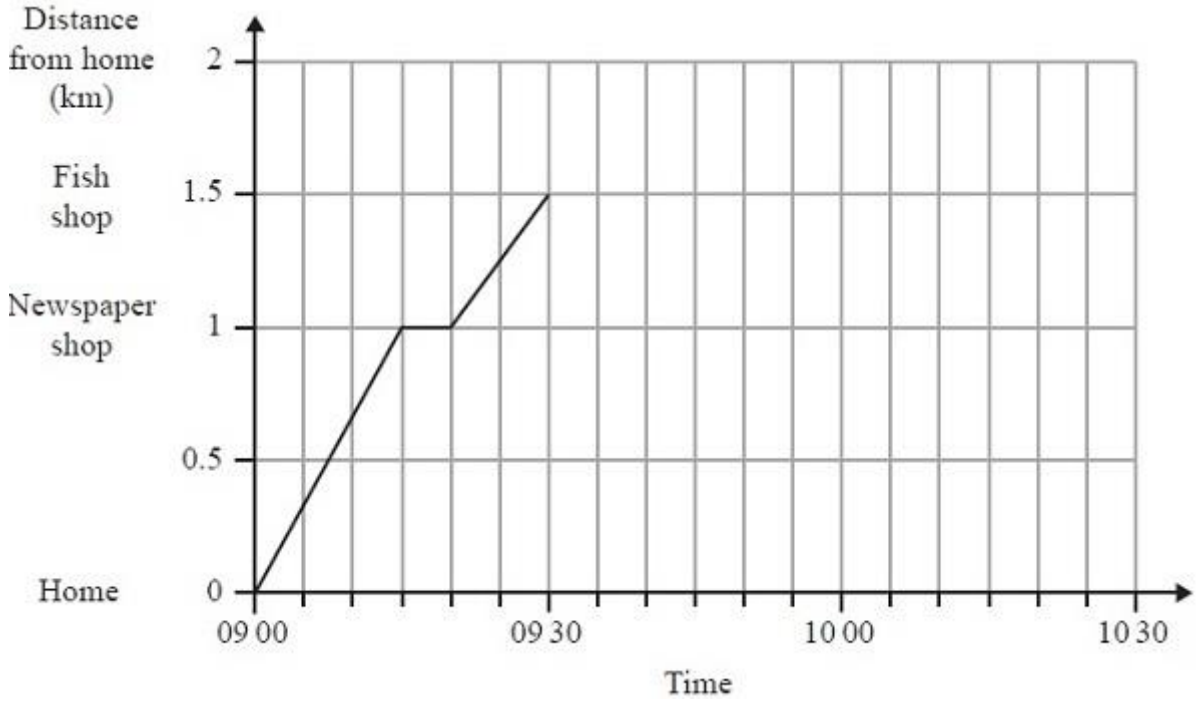
.....

(2)

(Total for Question is 4 marks)

Q7.

Mansi left her home at 09 00 to walk to the shops.
She stopped at the newspaper shop and then carried on to the fish shop.
Here is the distance-time graph for Mansi's journey from her home to the fish shop.



(a) How many minutes did it take Mansi to walk from the newspaper shop to the fish shop?

..... minutes

(1)

(b) Work out the average speed, in kilometres per hour, for Mansi's journey from her home to the newspaper shop.

..... km/h

(2)

Mansi stopped for 10 minutes in the fish shop.
She then walked home at a constant speed of 3 km/h.

(c) Show this information on the graph.

(2)

(Total for Question is 5 marks)

Q8.

(a) Express 600 as a product of powers of its prime factors.

Show your working clearly.

.....

(3)

(b) Simplify $\frac{5^{12}}{5^2 \times 5}$

Give your answer as a power of 5

.....

(2)

(Total for question = 5 marks)

Q9.

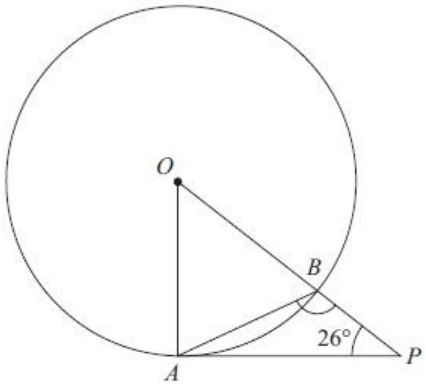


Diagram **NOT** accurately drawn

A and *B* are points on a circle, centre *O*.
PA is the tangent to the circle at *A*.
OBP is a straight line. Angle *APO* = 26°
Calculate the size of angle *ABP*.

.....°

(Total for question = 3 marks)

Q10.

Louis makes a model of a plane.

The wingspan of the model is 50 centimetres.
The wingspan of the real plane is 80 metres.

(a) Work out the scale of the model.

Give your answer in the form 1: *n*

1: .....

(2)

The length of the real plane is 72 metres.

(b) Work out the length of the model.

Give your answer in centimetres.

..... centimetres

(2)

(Total for question = 4 marks)

Q11.

Zara must take 5 tests.
Each test is out of 100
After 4 tests, her mean score is 64%.

What score must Zara get in her 5th test to increase her mean score in all 5 tests to 70%?

.....

(Total for Question is 4 marks)

Q12.

The diagram shows a parallelogram *ABCD*.

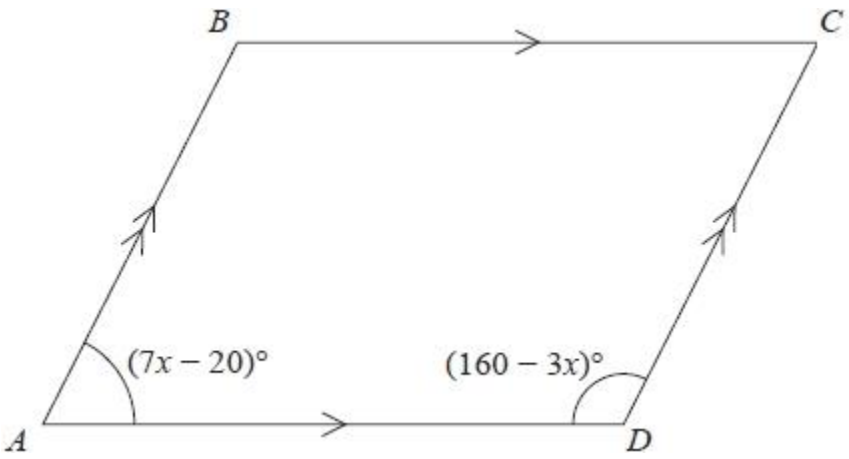


Diagram **NOT** accurately drawn

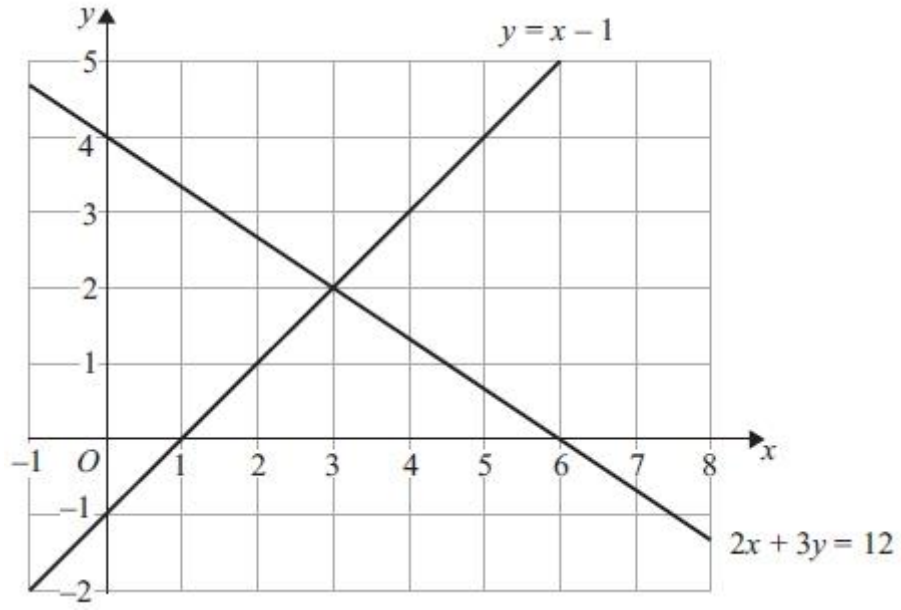
Angle *BAD* = (7*x* – 20)°
Angle *ADC* = (160 – 3*x*)°

Work out the value of *x*.
Show clear algebraic working.

x = ...

(Total for question = 3 marks)

Q13.



The diagram shows two straight lines.
The equations of the lines are $y = x - 1$ and $2x + 3y = 12$

(a) Write down the solution of the simultaneous equations

$$y = x - 1$$
$$2x + 3y = 12$$

x = ..., y = ...

(1)

(b) Find an equation of the line which is parallel to the line with equation $2x + 3y = 12$ and passes through the point (0, 10)

.....

(4)

(c) On the grid, mark with a cross (×) each point which satisfies both these inequalities $y > x - 1$ and $2x + 3y < 12$ and whose coordinates are **positive integers**.

(2)

(Total for question = 7 marks)

Q14.

The diagram shows a trapezium.

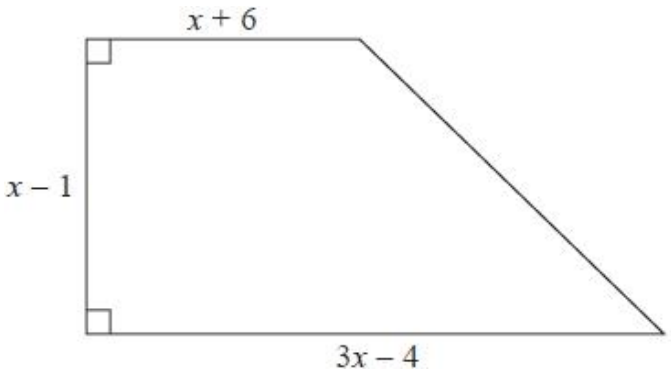


Diagram **NOT** accurately drawn

All measurements on the diagram are in centimetres. The area of the trapezium is 119 cm^2

(i) Show that $2x^2 - x - 120 = 0$

(ii) Find the value of x. Show your working clearly.

x = ...

(Total for question = 6 marks)

Q15.

Show that the recurring decimal $0.1\dot{7} = \frac{8}{45}$

(Total for question is 2 marks)

Q16.

(a) Factorise $a^2 - b^2$

.....

(1)

$N = 2^{22} - 1$

(b) Write N as the product of two integers, both of which are greater than 1000

..... × .....

(2)

(Total for question = 3 marks)

Q17.

Given that y is positive, make y the subject of $y = \sqrt{ay^2 + n}$

Show clear algebraic working.

y = ...

(Total for Question is 5 marks)

Q18.

A bag contains 60 beads.
x of the beads are red and the rest are green.
Altaaf takes at random a bead from the bag.

(a) State, in terms of x, the probability that Altaaf takes a red bead.

.....
(1)

Altaaf puts his bead back in the bag.
Another 20 **red** beads are added to those in the bag.
The probability that Altaaf takes a red bead is now doubled.

(b) (i) Use this information to write down an equation in x
and show that your equation can be expressed as $8x = 3(x + 20)$

(ii) Solve $8x = 3(x + 20)$
Show your working clearly.

x = ...
(5)

(Total for question is 6 marks)

Q19.

The diagram shows a rectangular playground of width x metres and length $3x$ metres.

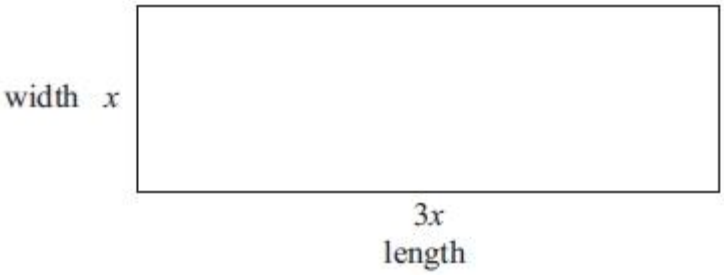


Diagram **NOT** accurately drawn

The playground is extended, by adding 10 metres to its width and 20 metres to its length, to form a larger rectangular playground.
The area of the larger rectangular playground is double the area of the original playground.

(a) Show that $3x^2 - 50x - 200 = 0$

(3)

(b) Calculate the area of the original playground.

.....m^2

(5)

(Total for question = 8 marks)