

Candidate Name

Candidate Number

Centre Name

Centre Number

| |
|--|
| |
| |
| |
| |

Paper 1 (Mathematics)

Model Paper

(2 hours)

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you must have a soft pencil (preferably of type B or HB), a clean eraser, and a dark blue or black pen.

INSTRUCTIONS:

- You must write your name, candidate number, centre name, and centre number on the answer sheets in the designated spaces.
- Attempt all the questions from the subjective section using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.
- You are allowed to use a calculator if needed.

INFORMATION:

- This paper has a total of 100 marks.
- The number of marks assigned for every question or its parts is indicated within brackets ().
- Rough work must be completed on this question paper.

Q. No. 1: Answer the following questions.

[12]

(i) Following are the four fractions:

$$\frac{1}{2} \quad \frac{17}{24} \quad \frac{3}{4} \quad \frac{5}{12}$$

Write these fractions in order of size. Start with the smallest fraction.

[2]

(ii) solve for c:

(a) $4c+5=11$

[2]

(b) $5(c+7)=20$

[2]

(c) $(c^3)^2$

[2]

(iii) Simplify.

(a) $3m-m-m+3m$

[2]

(b) $2 \times n \times p \times 4$

[2]

Q. No. 2: Answer the following questions.

[10]

(i) A square has an area of 81cm^2 .



Find the perimeter of the square.

[3]

(ii) Victoria throws an ordinary fair 6-sided dice once.

She says, “The probability of getting a 3 is half the probability of getting a 6”.

(a) Is Victoria correct?

You must explain your answer.

[2]

Andy throws the dice twice.

He says, “The probability of getting a 6 on both throws is $\frac{2}{6}$ ”.

(b) Is Andy correct?

[2]

You must explain your answer.

Indre throws the dice once.

She also throws a coin to get Heads or Tails.

(c) List all the possible outcomes she can get.

[2]

(iii) Write 0.075 as a fraction.

Give your fraction in its simplest form. [1]

Q. No. 3: Answer the following questions. [10]

(i) Rachel surveyed 10 people to find out the type of fruit they liked best.

The table gives information about her results.

| Type of fruit | Number of people |
|---------------|------------------|
| Apple | 2 |
| Banana | 5 |
| Orange | 3 |

(a) Which type of fruit is the mode? [1]

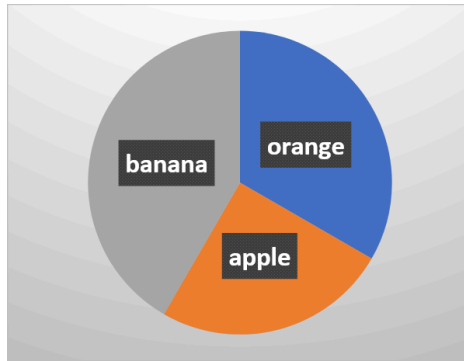
In Rachel's survey, 2 out of 10 people like apples best.

(b) Write 2 out of 10 as a percentage. [2]

(c) Pete also surveyed to find out the type of fruit people like best.

He asked 30 people which type of fruit they liked best.

He drew this pie chart for his results.



A smaller proportion of people like bananas best in Pete's survey than in Rachel's survey.

Explain how Pete's pie chart and Rachel's table show this. [3]

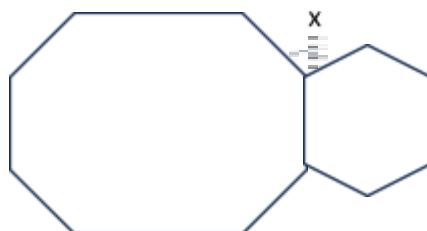
(ii) (a) Expand and simplify $3(y - 2) + 5(2y + 1)$ [2]

(b) Simplify $5u^2w^4 \times 7uw^3$ [2]

Q. No. 4:

[11]

(i)



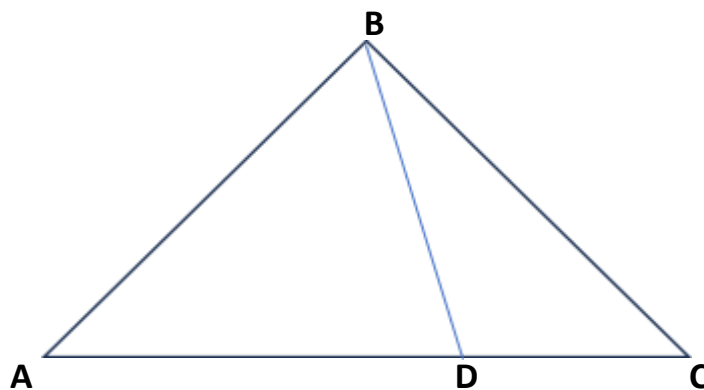
The diagram shows a regular octagon and a regular hexagon.

Find the size of the angle marked x .

You must show all your work.

[4]

(ii)



ABC is an isosceles triangle with $BA = BC$.

D lies on AC.

ABD is an isosceles triangle with $AB = AD$.

Angle $ABD = 72^\circ$.

Show that the triangle BCD is isosceles.

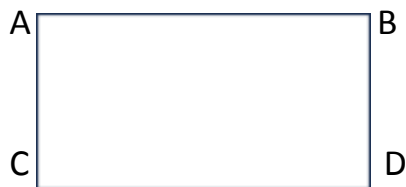
You must give a reason for each stage of your work.

[5]

(iii) (a) Write down the mathematical name of this solid. [1]



(b) ABCD is a rectangle. [1]



Add the correct mathematical symbol to the diagram to show that angle BCD is a right angle.

Q. No. 5: Answer the following questions. [11]

(i) Write down each of the following.

(a) An even number. [2]

(b) A factor of 25. [1]

(c) A prime number between 10 and 20. [1]

(d) A cube number. [2]

(ii) Find the highest common factor (HCF) of 35 and 91. [3]

(iii) Use the formula.

$$v = u + at$$

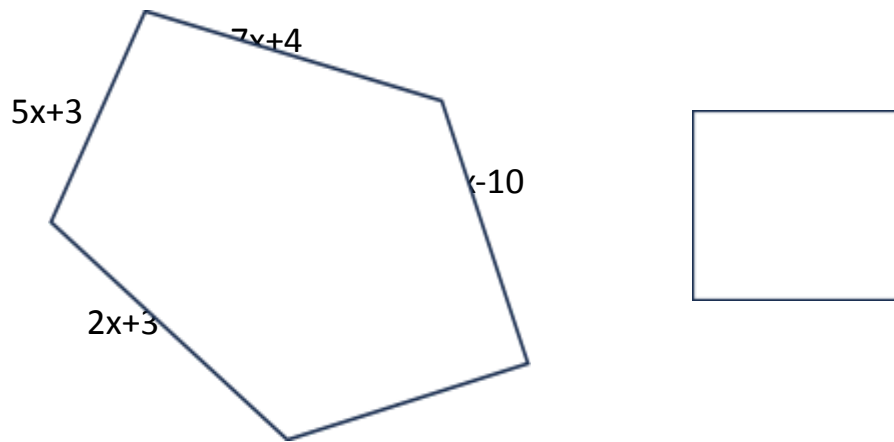
to find the final velocity, when

- the initial velocity is 8 m / s.
- the acceleration is 3 m / s².
- the time is 5 seconds.

[2]

Q. No. 6: Answer the following questions. [15]

(i) The perimeter of the pentagon is equal to the perimeter of the square.



Find an expression for the length of one side of the square. Give your answer in terms of x in its simplest form. [5]

(ii) James works from 2 pm until 8.30 pm on both Thursday and Friday.

He is paid £12 per hour.

On Saturday he is paid $1\frac{1}{2}$ times this hourly pay.

He works for 5 hours on Saturday.

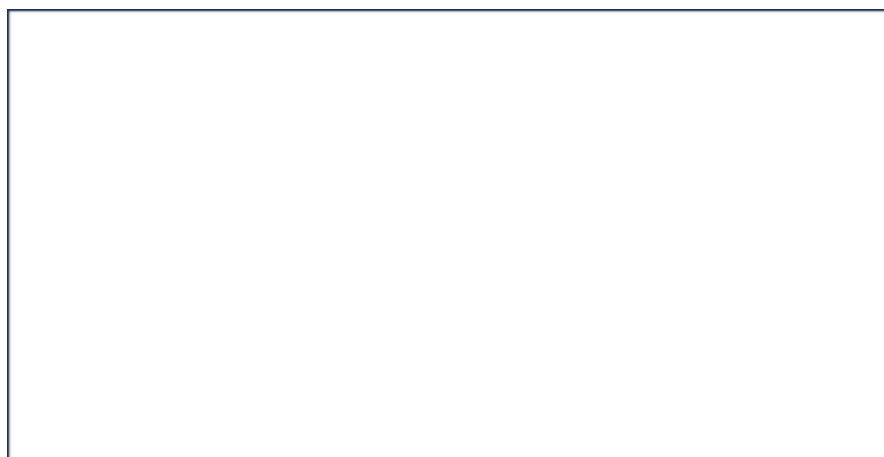
Calculate how much James earns in total for these three days. [5]

(iii) Children are asked whether they have a laptop or an iPad.

- 31 have a laptop.
- 48 have an iPad.
- 12 have both.
- 5 have neither.

(a) Represent this information on a Venn diagram.

[3]



(b) One of the children is chosen at random.

Write down the probability that they have an iPad but not a laptop. [2]

Q. No. 7: Answer the following questions. [12]

(i) Sketch an isosceles triangle.

Mark the triangle to show that it is isosceles. [2]

(ii) Complete this table for $y = 2x - 3$. [2]

| | | | | | |
|---|----|---|---|---|---|
| x | 0 | 1 | 2 | 3 | 4 |
| y | -3 | | 1 | | 5 |

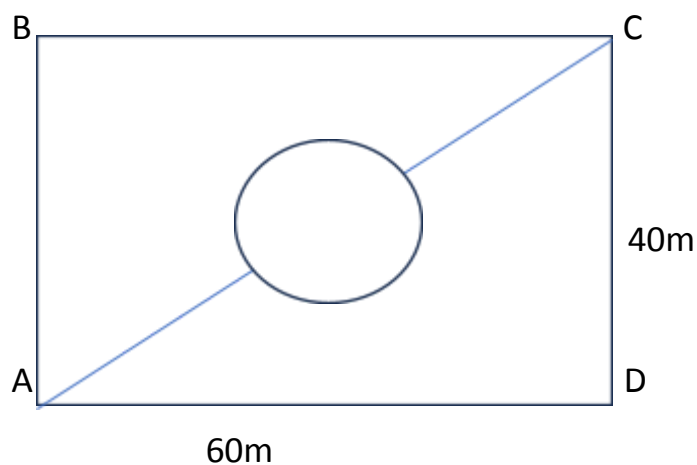
(iii) Draw the graph of $y = 2x - 3$ for values of x from 0 to 4. [3]

(iv) Show that $3r = 2(5k^2 - 2r)$ can be rearranged to $k = \sqrt{\frac{7r}{10}}$ [5]

Q. No. 8: Answer the following questions.

[6]

The rectangle ABCD represents:



The lines show all the paths in the park.

The circular path is in the centre of the rectangle and has a diameter of 10 m.
Calculate the shortest distance from A to C across the park, using only the paths shown.

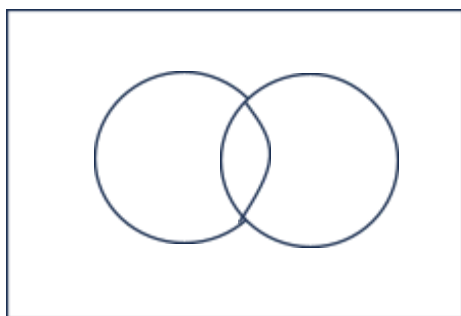
[6]

Q No 9.

[13]

(i) There are 30 students in a class.

20 students study Physics, 15 students study Chemistry, while 3 students study neither Physics nor Chemistry.



(i) Copy and complete the Venn diagram to show this information. [3]

(ii) Find the number of students who study both Physics and Chemistry. [2]

(iii) A student is chosen at random. Find the probability that the student studies Physics but not Chemistry. [3]

(iv) A student who studies Physics is chosen at random. Find the probability that this student does not study Chemistry. [2]

(ii) $x \text{ km/h} = y \text{ mph}$

Use $8 \text{ km/h} = 5 \text{ mph}$ to write a formula for y in terms of x . [3]