Grade 8 Math Model Paper 1

MODEL PAPER

Full marks 50 · 2 hours

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 50

All questions are compulsory. Time: 2 hours.

A practice paper by Science Playground, made to CDC's Specification Grid 2078, Mathematics, Grades 6–8; not an official CDC or exam board paper. Mark it yourself online: the QR code below opens the paper with its answers.

A full practice run of the BLE Mathematics paper: 50 marks in 2 hours, 12 questions, every one compulsory. The marks of each part are in brackets. Show your working on paper as in the exam hall, then open each part's answer and give yourself the marks its scheme allows. You need graph paper for Questions 7 and 11, and a ruler, a compass and a protractor for Questions 10 and 12.

Question 1 — 3 marks

Eight students of Riya's group in a school in Dhankuta have the roll numbers 1 to 8. In the Venn diagram, U is the set of these roll numbers, S is the set of those in the science club and M is the set of those in the maths club.

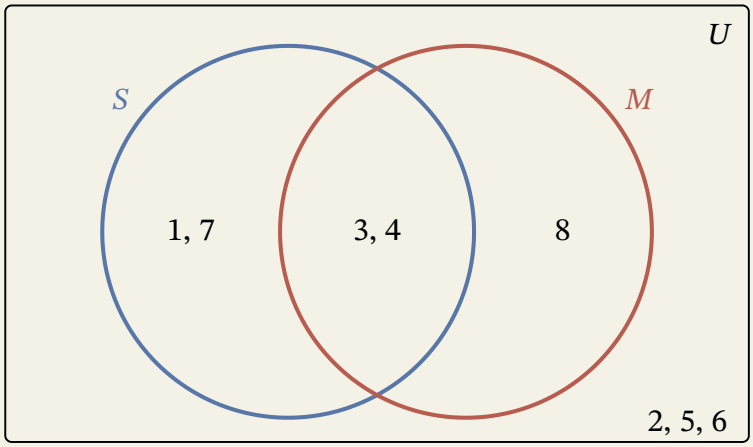


Figure 1 The roll numbers in the two clubs.

a. Define overlapping sets. **[1]**

b. Write any two proper subsets of M. **[1]**

c. If the students with roll numbers 1 and 7 leave the science club, what will be the relation between S and M? Give a reason. **[1]**

Question 2 — 4 marks

Deepak goes to a cycle shop in Butwal to buy a bicycle. Its marked price is Rs 14,000.

a. If the cost price and the profit are represented by CP and P respectively, write the formula to find the profit percent. **[1]**

b. How much discount does Deepak get on the bicycle at a discount of 15%? **[1]**

c. After giving this discount, the shopkeeper still makes a profit of 19%. What was the cost price of the bicycle? **[2]**

Question 3 — 5 marks

Kanchan keeps buffaloes at Lamahi in Dang. To buy one more, she borrows Rs 1,50,000 from a cooperative at the rate of Rs 12 on every Rs 100 a year.

a. Write the formula to find the simple interest I on a principal P for T years at $R\%$ a year. **[1]**

b. How much interest does she owe after 2 years 6 months? **[2]**

c. After the 2 years 6 months, Kanchan's savings and her sister's savings are in the ratio $5:3$, and Kanchan has Rs 60,000 more. Find the savings of each. Can the two of them together clear the loan and its interest then? Give a reason. **[2]**

Question 4 — 5 marks

A tea factory in Ilam packed 4,65,000 kg of tea in one year.

a. Write the quantity of tea in scientific notation. **[1]**

b. If 40 packets of the same size weigh 12 kg, how much do 65 such packets weigh? **[1]**

c. Convert $0.\overline{27}$ into a fraction. **[2]**

d. The factory's machine has a row of five lamps to show a number in the binary number system: a lit lamp means 1 and an unlit lamp means 0. Can this row show the number 37? Give a reason. **[1]**

Question 5 — 5 marks

The figure shows a rectangular park in Hetauda, 42 m long and 28 m wide. In the middle of it there is a round pond of diameter 14 m. (Take $\pi = \frac{22}{7}$.)

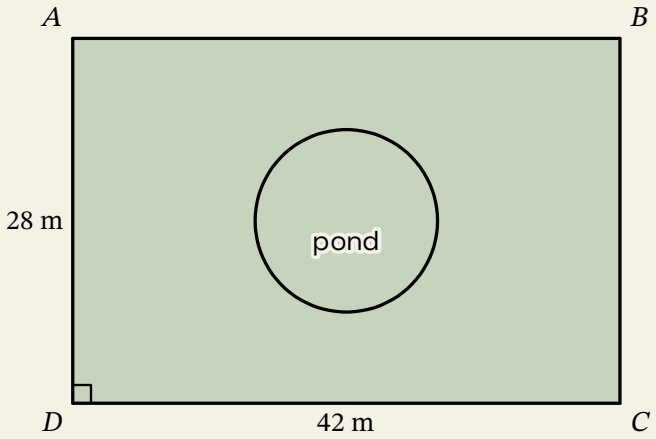


Figure 2 The park and its pond.

a. Write the formula to find the circumference of a circle of radius r. **[1]**

b. Find the circumference of the pond. **[1]**

c. What is the area of the park except the pond? **[2]**

d. A member of the ward says, "If we make the pond's diameter twice as long, it will take up twice as much land." Is this right? Give a reason. **[1]**

Question 6 — 3 marks

a. Express $(x^m)^n$ as a power of x. **[1]**

b. Simplify: $\frac{1}{x-2} - \frac{1}{x+2}$ **[2]**

Question 7 — 3 marks

Two equations are given below.

$x + y = 6$ **and** $2x - y = 3$

a. What is the shape of the graph of each of these equations? **[1]**

b. Solve the equations by using a graph. **[2]**

Question 8 — 4 marks

a. Find the highest common factor (HCF) of $x^2 + 2x - 15$ and $x^2 - 25$. **[2]**

b. Arjun's family in Bhaktapur has a long rectangular sukul (a straw mat) for the courtyard. Its area is $(x^2 + 2x - 15)$ m² and its breadth is $(x - 3)$ m. If its length is 9 m, find its area. **[2]**

Question 9 — 4 marks

Dawa sets up a ridge tent for trekkers at a camp near Namche. The tent has the shape of a triangular prism. The figure shows its end PQR, with a crossbar ST parallel to the ground QR.

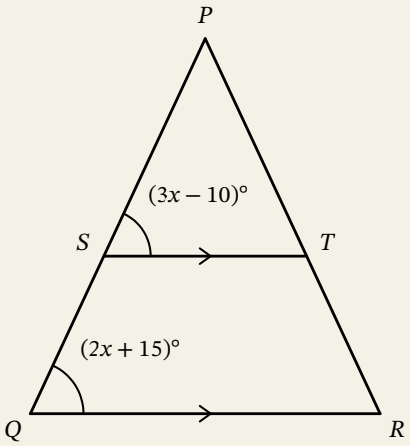


Figure 4 $ST \parallel QR$, $\angle PQR = (2x + 15)^\circ$ and $\angle PST = (3x - 10)^\circ$.

a. Write the number of faces, vertices and edges of a triangular prism. **[1]**

b. Find the value of x. **[2]**

c. On a plan of the camp, where 1 unit is 1 m, a tent peg is at $A(1, 2)$ and a tree is at $B(5, 5)$. Dawa has a rope 4.5 m long. Will it reach from the peg to the tree? Give a reason. **[1]**

Question 10 — 5 marks

a. Construct a parallelogram $ABCD$ with $AB = 6.5$ cm, $BC = 4.5$ cm and the diagonal $AC = 9$ cm. **[3]**

b. Draw the diagonal BD too, and let the diagonals cross at O. Prove that $\triangle AOB \cong \triangle COD$. **[2]**

Question 11 — 6 marks

a. Write the tessellation number of the regular tessellation made of regular hexagons. **[1]**

Answer the following questions on the basis of the given figure. $\triangle ABC$ is drawn on a map, on which the Y-axis points north.

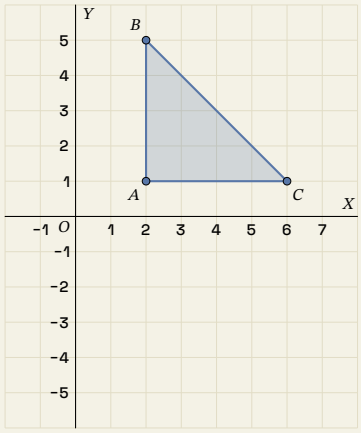


Figure 7 $\triangle ABC$ **on a grid.**

b. Find the bearing of C from B, and then the bearing of B from C. **[2]**

c. Reflect $\triangle ABC$ in the X-axis. Draw the image on the same graph, and write the coordinates of A', B' and C'. **[3]**

Question 12 — 3 marks

Swastika's family in Gulmi harvested these crops last year.

Crop	Paddy	Maize	Millet	Potato
Harvest	1,200 kg	900 kg	300 kg	600 kg

a. What is the average harvest of a crop? **[1]**

b. Present the harvest in a pie chart. **[2]**