Grade 8 Math Model Paper 10

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 Question 11, a ruler and a compass for Question 10, and a compass and a protractor for Question 12.

Question 1 — 3 marks

Bhawana's class in Tikapur plays a game with nine slips numbered 1 to 9. In the Venn diagram, U is the set of the numbers on the slips, A is the set of prime numbers among them and B is the set of odd numbers among them.

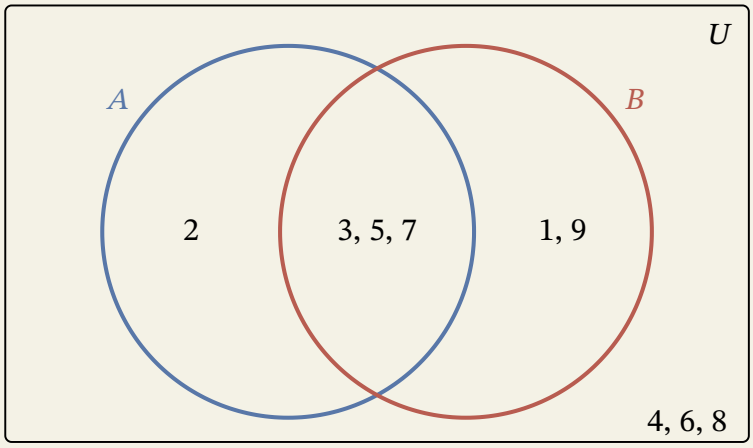


Figure 1 The numbers on the slips.

a. Write U in set-builder form. **[1]**

b. Write the set of elements of A that are not in B. **[1]**

c. One slip is picked. Bhawana wins if its number is in both A and B, and her friend wins if it is in neither. Is the game fair to both? Give a reason. **[1]**

Question 2 — 4 marks

Sharada put Rs 50,000 in a cooperative in Baitadi at simple interest. After 4 years, the amount was Rs 68,000.

a. Write the formula to find the interest I from the amount A and the principal P. **[1]**

b. How much interest did she earn in the 4 years? **[1]**

c. Find the rate of interest. **[2]**

Question 3 — 5 marks

Dorje is packing food for a trek from Jiri.

a. Write the means of the proportion $5:2::30:12$. **[1]**

b. He packs 42 kg of rice and lentils in the ratio $5:2$. How much of each does he pack? How many more kilograms of lentils would make the ratio $2:1$? **[2]**

c. The food is enough for 12 people for 15 days. After 5 days, 4 more people join the group, and the trek has 8 days left. Will the food last? Give a reason. **[2]**

Question 4 — 5 marks

Nirmal repairs computers in Gaighat.

a. A hard disk holds 5,00,00,00,00,000 bytes. Write this number in scientific notation. **[1]**

b. A shelf in his shop is labeled 1110_2. Write this number in the quinary number system. **[2]**

c. A film takes 2×10^9 bytes. How many such films can the disk hold? **[1]**

d. A pen drive is marked Rs 900. A customer who needs three of them can choose "Buy 3, pay for 2" or "30% off each". Which should the customer choose? Give a reason. **[1]**

Question 5 — 5 marks

Pabitra has a round lawn in Dhankuta, of radius 10 m. In it she makes a flower bed in the shape of a regular hexagon $ABCDEF$, with its corners on the edge of the lawn, as in the figure. The lines from the center O cut the bed into six equilateral triangles of side 10 m. (Take $\pi = 3.14$ and $\sqrt{3} = 1.73$.)

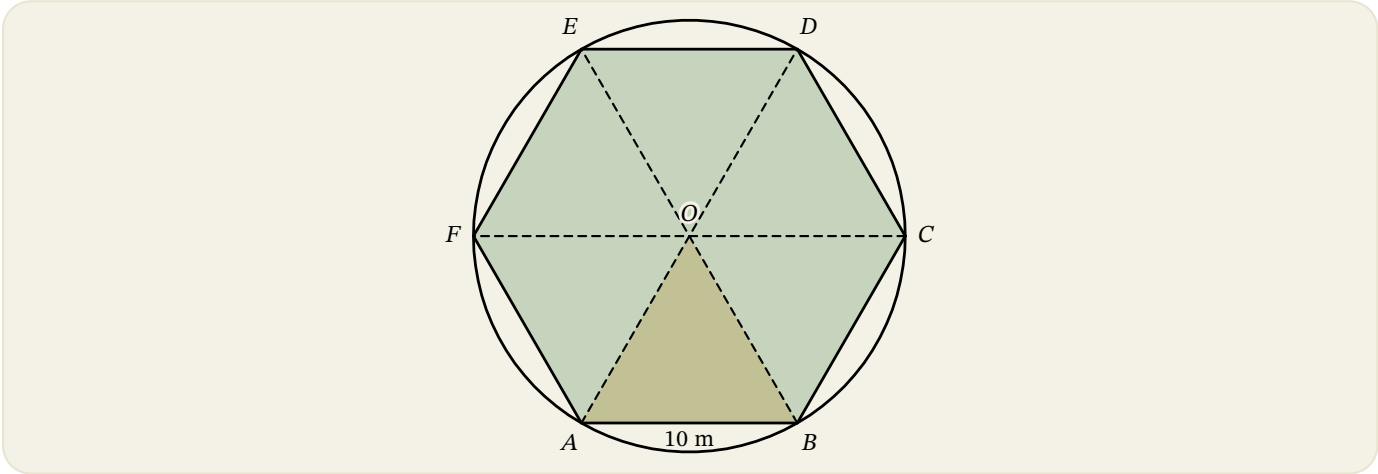


Figure 2 The lawn and the flower bed.

a. Write the formula to find the area of an equilateral triangle of side a. **[1]**

b. Find the area of $\triangle OAB$. **[1]**

c. Find the area of the lawn outside the flower bed. **[2]**

d. Pabitra has 60 m of edging. It goes exactly round the flower bed. Will it also go round the edge of the lawn? Give a reason. **[1]**

Question 6 — 3 marks

a. Write $a^2 - b^2$ as a product of two factors. **[1]**

b. Simplify: $\dfrac{x^{a+b} \times x^{a-b}}{(x^a)^2}$ **[2]**

Question 7 — 3 marks

An equation is given below.

$x^2 - 7x = 18$

a. Write this equation in the form $ax^2 + bx + c = 0$. **[1]**

b. Solve the equation by the factorization method. **[2]**

Question 8 — 4 marks

a. Simplify: $\dfrac{x^2 - 9}{x^2 + 5x + 6} \times \dfrac{x + 2}{x - 3}$ **[2]**

b. Rekha throws a ball straight up on a playground in Kohalpur. After t seconds, its height is $(20t - 5t^2)$ m. She says, "It is 15 m high only once." Is she right? Make a quadratic equation and give a reason. **[2]**

Question 9 — 4 marks

Prem is helping to plan a community hall in Bajura.

a. Which three regular polygons can each cover the hall's floor on their own? **[1]**

b. In the figure, T is a tower beside the hall. The bearing of village A from T is 110° and the bearing of village B from T is 200°. Find $\angle ATB$, and the bearing of T from B. **[2]**

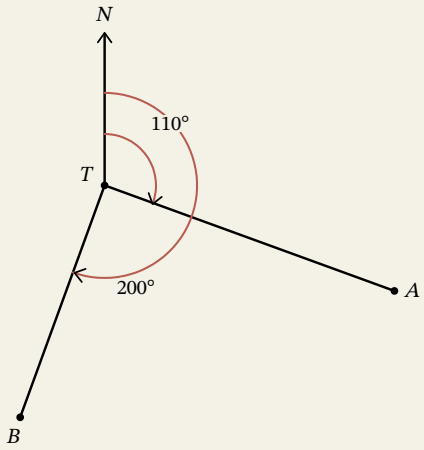


Figure 3 The villages A and B, seen from T.

c. For the children's corner, Prem numbers the net below to make a die, on which opposite faces must add up to 7. Will it make a proper die? Give a reason. **[1]**

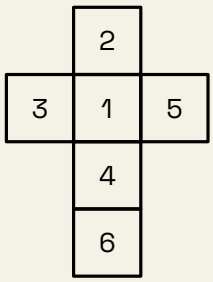


Figure 4 Prem's net.

Question 10 — 5 marks

a. Construct a parallelogram $ABCD$ with $AB = 6$ cm, $AD = 4$ cm and the diagonal $AC = 8$ cm. **[3]**

b. M is the midpoint of AB and N is the midpoint of DC. Join DM and BN. Prove that $\triangle AMD \cong \triangle CNB$. **[2]**

Question 11 — 6 marks

Bikram in Kapilvastu is drawing patterns on graph paper.

a. In which quadrant does he find the point $A(-3, 2)$? **[1]**

b. In one of his patterns, $DE \parallel BC, \angle ADE = 65^\circ$ and $\angle ACB = 55^\circ$. Find $\angle ABC$ and $\angle BAC$. **[2]**

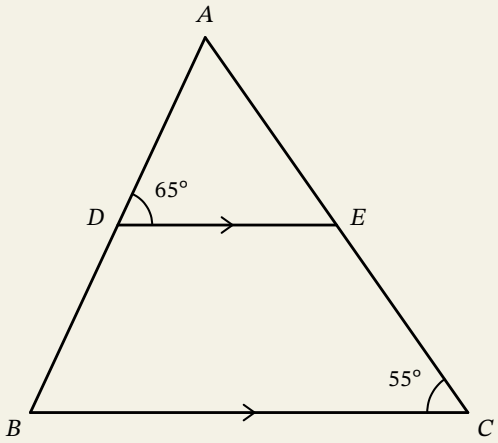


Figure 7 $DE \parallel BC$ in $\triangle ABC$.

Answer the following question on the basis of the given figure.

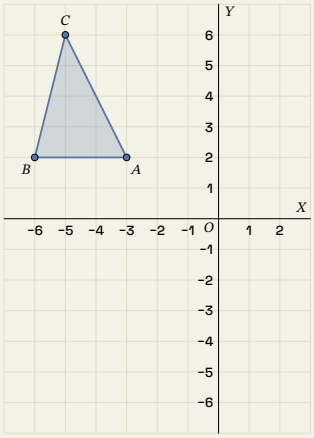


Figure 8 $\triangle ABC$ on a grid.

c. Rotate $\triangle ABC$ about the origin through +90∘. Draw the image on the same graph, and write the coordinates of A', B' and C'. **[3]**

Question 12 — 3 marks

Kishor asked the 60 students of his class in Syangja where the school trip should go.

Place	Pokhara	Lumbini	Chitwan	Janakpur
Students	21	18	15	6

a. What percent of the students chose Pokhara? **[1]**

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