Grade 8 Math Model Paper 7

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 Questions 4 and 10, and a compass and a protractor for Question 12.

Question 1 — 3 marks

A health post in Sindhupalchok opens on the days of the month in U. Pooja lives nearby. In the Venn diagram, D is the set of days a doctor comes, and T is the set of days a dentist comes.

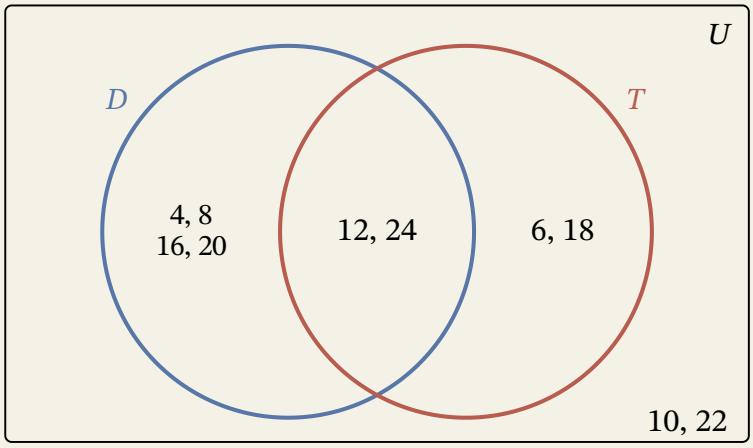


Figure 1 The doctor's and the dentist's days.

a. What is a proper subset of a set? **[1]**

b. Write the set of days on which the doctor and the dentist both come. **[1]**

c. Pooja will be away from day 11 to day 20, and she wants to see the doctor and the dentist on the same day. Can she still do it this month? Give a reason. **[1]**

Question 2 — 4 marks

Salim makes wooden furniture in Nepalgunj.

a. What is the marked price of an article? **[1]**

b. He marks a table at Rs 6,000 and gives a discount of 10%. How much is the discount? **[1]**

c. A chair costs him Rs 2,700 to make. He wants a profit of 20% after giving a discount of 10%. At what price should he mark it? **[2]**

Question 3 — 5 marks

Srijan is a contractor in Surkhet.

a. Write the formula to find the principal P from the interest I, the time T and the rate R. **[1]**

b. He paid Rs 9,000 in interest on a loan for 3 years at 10% a year. How much did he borrow? **[2]**

c. To dig a canal, he can hire 12 workers at Rs 900 a day each, who would take 15 days, or 18 workers at Rs 850 a day each. Which should he choose to spend less? Give a reason. **[2]**

Question 4 — 5 marks

Aakriti in Panauti is getting ready for her school's science fair.

a. There are 67 plants in the school garden, and she puts the number on her stall in the quinary number system. What does she write? **[1]**

b. Show $\sqrt{5}$ on a number line. **[2]**

c. Her map of Panauti has the scale $1{:}50000$. Two places are 6 cm apart on it. How far apart are they really? **[1]**

d. She sets out a square mat of area 5 m². Her tape shows 2.24 m for a side, and she says, "The side is exactly 2.24 m." Is she right? Give a reason. **[1]**

Question 5 — 5 marks

Basanta keeps goats in Tanahun. He uses 88 m of wire to fence a round pen with center O, and he leaves a path 7 m wide all round it, as in the figure. (Take $\pi = \frac{22}{7}$.)

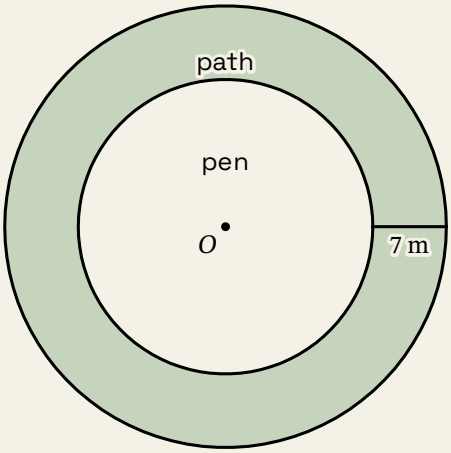


Figure 3 The pen and the path round it.

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

b. Find the radius of the pen. **[1]**

c. Find the area of the path. **[2]**

d. Basanta wants a fence round the outside of the path too. He says, "The path is 7 m wide, so that fence needs only 14 m more wire than the pen's 88 m." Is he right? Give a reason. **[1]**

Question 6 — 3 marks

a. Express $x^m \times x^n$ as a power of x. **[1]**

b. Find the value of $52^2 - 48^2$ by using factors. **[2]**

Question 7 — 3 marks

An equation is given below.

$x^2 + x - 20 = 0$

a. What is the degree of this equation? **[1]**

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

Question 8 — 4 marks

a. Simplify: $\dfrac{3}{x-3} - \dfrac{18}{x^2-9}$ **[2]**

b. Srijana has to go 120 km from Dang. A bus runs at x km an hour and a microbus at $(x + 20)$ km an hour. Write the time the microbus saves as one fraction. When $x = 40$, will it save at least 45 minutes? Give a reason. **[2]**

Question 9 — 4 marks

Nisha is setting up a small park in Rajbiraj, and she draws it on a plan with the gate at the origin.

a. On the plan, a lamp is at $P(x, y)$. Write the formula to find its distance from the gate at $O(0, 0)$. **[1]**

b. She paves a walk with the pattern in the figure, of equilateral triangles and squares. Write its tessellation number, and show that the angles at one corner add up to $360\circ$. **[2]**

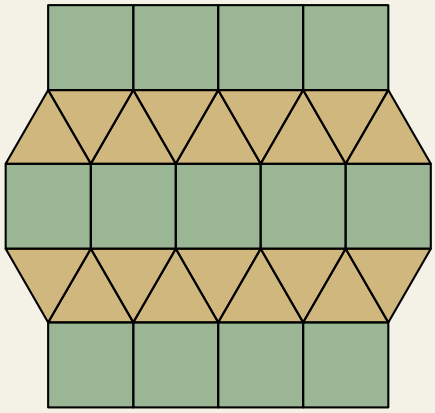


Figure 4 Part of the walk.

c. For a dustbin in the shape of a cylinder with a lid, she cuts a net from tin: a rectangle 44 cm long and two circles of radius 6 cm. Will the circles fit the ends exactly when the 44 cm edge is rolled into a ring? Give a reason. (Take $\pi = \dfrac{22}{7}$.) **[1]**

Question 10 — 5 marks

a. Construct a rhombus $ABCD$ with $AB = 5$ cm and $\angle DAB = 75^\circ$. **[3]**

b. Draw the diagonal AC. Prove that $\triangle ABC \cong \triangle ADC$, and write what this tells you about $\angle BAC$ and $\angle DAC$. **[2]**

Question 11 — 6 marks

Chiring is drawing a plan of his school in Manang, to the scale 1 cm = 5 m.

a. On the plan, two parallel lines are cut by a transversal. What can you say about the corresponding angles? **[1]**

b. The playground is 8 cm long on the plan. How long is it really? How long will a wall 65 m long be on the plan? **[2]**

Answer the following question on the basis of the given figure, in which $ABCD$ is a flower bed on the plan's grid.

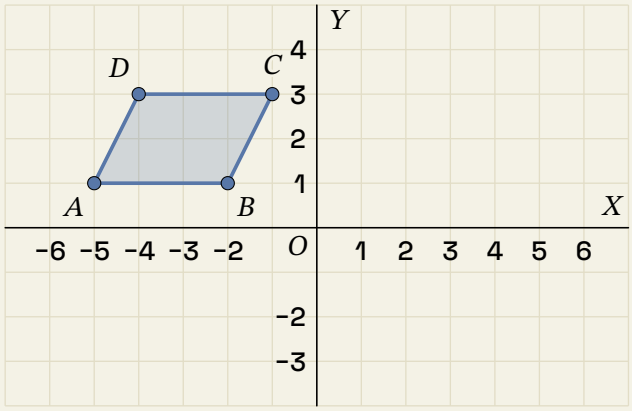


Figure 7 $ABCD$ on a grid.

c. The bed is to be moved 6 units to the right and 3 units down. Translate $ABCD$, draw the image on the same graph, and write the coordinates of A', B', C' and D'. **[3]**

Question 12 — 3 marks

Nima in Dolakha noted how he spends one school day.

Sleep	School	Study	Play	Other things
9 hours	7 hours	3 hours	2 hours	3 hours

a. In a pie chart of his day, how many degrees stand for one hour? **[1]**

b. Present his day in a pie chart. **[2]**