Grade 8 Math Model Paper 8

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 and a compass for Question 10.

Question 1 — 3 marks

The till of a shop in Bharatpur holds notes of the values in U, in rupees. In the Venn diagram, W is the set of the values of the notes in Prashant's wallet, one note of each.

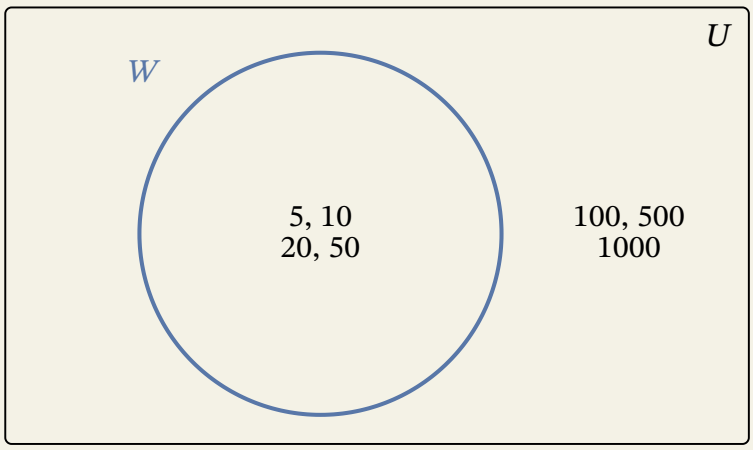


Figure 1 The notes in the till and in the wallet.

a. When is a set A a subset of a set B? **[1]**

b. Write all the subsets of W that have three elements. **[1]**

c. Prashant wants to pay exactly Rs 40 from his wallet, with no change. Is there a subset of W that adds up to 40? Give a reason. **[1]**

Question 2 — 5 marks

Sujata sells spices in Kalaiya.

a. A packet of her masala has 1.2 kg of coriander to 800 g of cumin. Write this ratio in its lowest terms. **[1]**

b. She sold her old grinder for Rs 7,200, at a loss of 10%. What did it cost her? **[2]**

c. A sack in her store is labeled 110010_2, the number of kilograms it holds. Write this number in the decimal number system. **[1]**

d. A friend tells Sujata, "Put your money in at 12% simple interest a year, and in 8 years it will double." Is this true? Give a reason. **[1]**

Question 3 — 4 marks

Anusha runs a flour mill in Taplejung.

a. What is direct variation? **[1]**

b. Her mill grinds 150 kg of flour in 3 hours. How much does it grind in 7 hours? **[1]**

c. At the same rate, how many such mills are needed to grind 2,000 kg in 5 hours? **[2]**

Question 4 — 5 marks

Pratik works at a rice mill in Jhapa. One grain of rice weighs 2×10^{-2} g, and a sack holds 50 kg of rice.

a. What is the form of a number in scientific notation? **[1]**

b. How many grains of rice are there in a sack? Give the answer in scientific notation. **[2]**

c. Nepal has about 2.9×10^{7} people. Pratik says, "The grains in 10 sacks are enough to give everyone in Nepal one grain." Is he right? Give a reason. **[2]**

Question 5 — 5 marks

Samjhana has a plot $ABCD$ in Nuwakot in the shape of a parallelogram, with $AB = 40$ m, $AD = 25$ m and a height of 20 m from AB to DC. Along AB she has a flower bed in the shape of a semicircle of diameter 14 m. (Take $\pi = \frac{22}{7}$.)

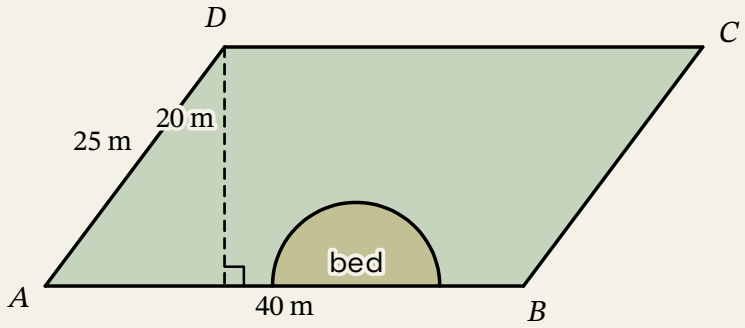


Figure 2 Samjhana's plot.

a. Write the formula to find the area of a parallelogram with base b and height h. **[1]**

b. Find the area of the plot. **[1]**

c. Find the area of the plot except the flower bed. **[2]**

d. A neighbor says, "Multiply the two sides, as for a rectangle: the plot is $40 \times 25 = 1000$ m²." Is the neighbor right? Give a reason. **[1]**

Question 6 — 3 marks

a. When can two algebraic fractions be added by simply adding their numerators? **[1]**

b. Simplify: $\dfrac{5^{n+2} \times 5^{1-n}}{25}$ **[2]**

Question 7 — 3 marks

Two equations are given below.

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

a. Why are these called linear equations? **[1]**

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

Question 8 — 4 marks

a. Factorize: $x^3 - 2x^2 + 3x - 6$ **[2]**

b. Imran says, "$99^2 - 1$ ends in two zeros," and he hasn't worked out 99^2. Is he right? Give a reason by using factors. **[2]**

Question 9 — 4 marks

Phurba guides trekkers from Lukla.

a. A stone marker beside the trail has the shape of a cuboid. How many edges does a cuboid have? **[1]**

b. The bearing of a lodge L from the helipad H is 240°. Find the bearing of H from L. Phurba stands at L, facing H, and turns 90° clockwise. What bearing is he facing now? **[2]**

c. On Phurba's map, where 1 unit is 1 km, three tea houses are at $A(-2,\,1)$, $B(2,\,4)$ and $C(5,\,0)$. He says that B is as far from A as it is from C. Is he right? Give a reason. **[1]**

Question 10 — 5 marks

a. Construct a parallelogram $ABCD$ with $AB = 7$ cm, $BC = 4.5$ cm and $\angle CAB = 30^\circ$, taking C as the point farther from A. **[3]**

b. From D, a perpendicular DP is drawn to AB, and from B, a perpendicular BQ is drawn to DC. Prove that $\triangle ADP \cong \triangle CBQ$. **[2]**

Question 11 — 6 marks

Lalita is laying out a pond and paths in a school garden in Pyuthan.

a. A path is paved in the tessellation 3.3.3.3.3.3. Which regular polygon is used? **[1]**

b. In the figure, two parallel paths AB and CD are crossed by a third path EF. Find the values of x and y. **[2]**

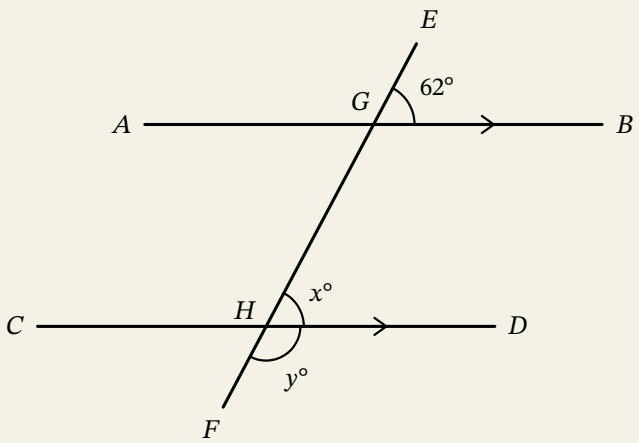


Figure 6 $AB \parallel CD$.

Answer the following question on the basis of the given figure, in which the trapezium $PQRS$ is the pond on a grid.

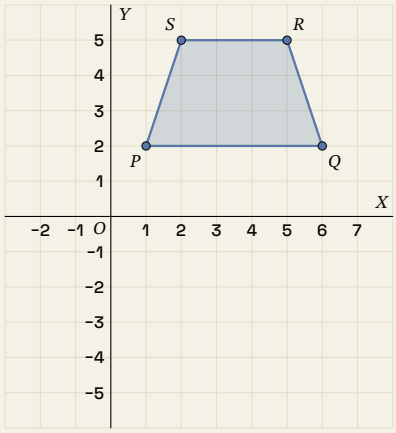


Figure 7 The trapezium $PQRS$ on a grid.

c. Reflect $PQRS$ in the X-axis. Draw the image on the same graph, and write the coordinates of P', Q', R' and S'. **[3]**

Question 12 — 3 marks

Shristi's school library in Parasi has 720 books. She drew a pie chart of them, but one angle in her notes has been left blank.

Kind of book	Stories	Science	History	Others
Angle	130°	90°	x°	60°

a. Find the value of x. **[1]**

b. How many books of stories are there? How many more are they than the books of history? **[2]**