Grade 8 Math Model Paper 3

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

Question 1 — 3 marks

Lhamu in Rasuwa writes the numbers 1 to 12 on cards. In the Venn diagram, U is the set of these numbers, F is the set of factors of 12 and E is the set of even factors of 12.

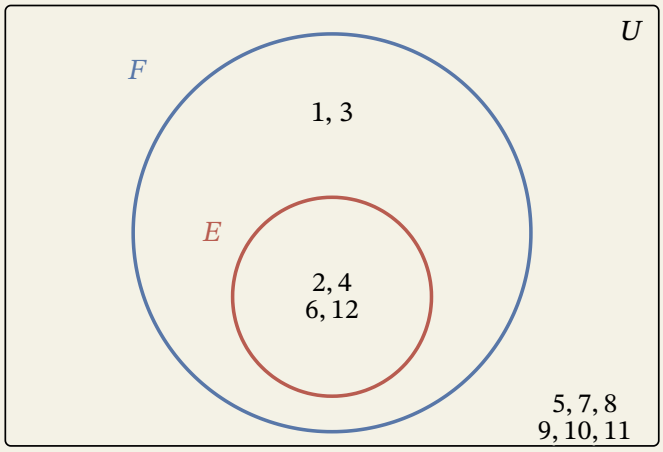


Figure 1 The factors of 12.

a. Write "E is a proper subset of F" with a symbol. **[1]**

b. Write the set of elements of F that are not in E. **[1]**

c. Which numbers must be added to E to make it an improper subset of F? Give a reason. **[1]**

Question 2 — 4 marks

Aman's team of 18 workers can finish a stretch of road near Gulariya in Bardiya in 20 days.

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

b. In how many days can 24 workers finish the same road? **[1]**

c. The 18 workers start the work, but after 8 days 6 of them leave for another job. How many days does the whole work take? **[2]**

Question 3 — 5 marks

Asmina has a shop in Damak. She buys a sewing machine for Rs 24,000 and marks it at Rs 30,000.

a. On which price is the discount percent worked out? **[1]**

b. She sells the machine at a discount of 12%. Find her profit percent. **[2]**

c. She deposits all the Rs 26,400 in a bank at 10% simple interest a year, because she needs Rs 33,000 for a new machine after 2 years. Will she have enough by then? If not, how much longer must she wait? **[2]**

Question 4 — 5 marks

Nabin works in a workshop in Baglung that makes lokta paper. One sheet is 0.00009 m thick.

a. Write the thickness of a sheet in scientific notation. **[1]**

b. Find the height of a stack of 500 sheets, in scientific notation. **[2]**

c. The heights of two stacks are in the ratio $3:5$, and the taller one is 40 cm high. How high is the other? **[1]**

d. One bundle is labeled 1011_2 and another 23_5, each giving its number of sheets. Which holds more? Give a reason. **[1]**

Question 5 — 5 marks

Reshma has a four-sided plot $ABCD$ in Chitwan, with a diagonal AC of 50 m. The perpendiculars from B and D to it are 18 m and 12 m long. There is a round pond in the plot, of circumference 31.4 m. (Take $\pi = 3.14$.)

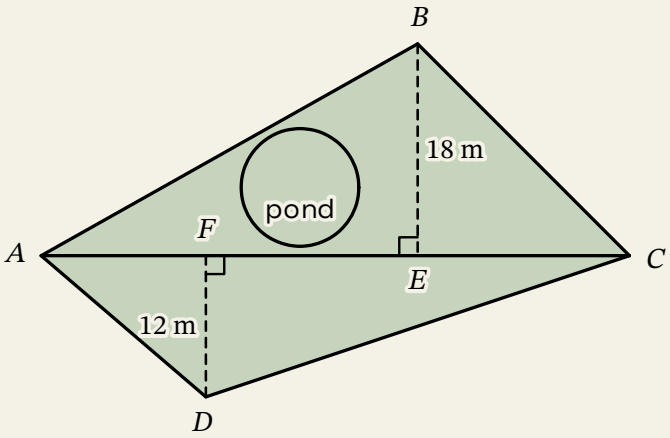


Figure 2 Reshma's plot.

a. Write the formula to find the area of a quadrilateral with a diagonal d and perpendiculars h_1 and h_2 on it. **[1]**

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

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

d. Does the pond take up more than one tenth of the plot? Give a reason. **[1]**

Question 6 — 3 marks

a. When is an algebraic fraction in its lowest terms? **[1]**

b. Simplify: $\dfrac{(3x^2)^3 \times x^{-2}}{9x^3}$ **[2]**

Question 7 — 3 marks

An equation is given below.

$x^2 - 3x - 28 = 0$

a. What is an equation of this kind called? **[1]**

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

Question 8 — 4 marks

a. Factorize: $6x^2 + 7x - 3$ **[2]**

b. Kiran's school hall in Sarlahi has a rectangular carpet whose length is 2 m more than its breadth, and its area is 24 m². Make a quadratic equation, and find the length and the breadth. **[2]**

Question 9 — 4 marks

Chandra, a mason in Patan, lays the floor shown in the figure, of regular polygons with 3 and 12 sides.

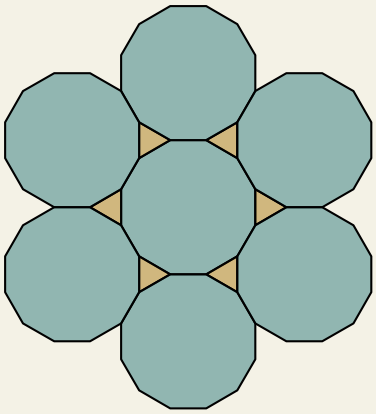


Figure 3 Part of the floor.

a. What is a semi-regular tessellation? **[1]**

b. Find the size of each interior angle of the regular polygon with 12 sides. **[2]**

c. At the edge of the floor, the border lines AB and CD are crossed by EF as in the figure. Are AB and CD parallel? Give a reason. **[1]**

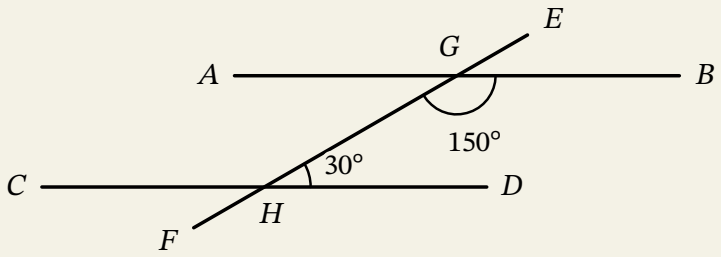


Figure 4 $\angle BGH = 150^\circ$ and $\angle DHG = 30^\circ$.

Question 10 — 5 marks

A triangular park ABC in Birendranagar has $AB = 60$ m, $BC = 80$ m and $AC = 100$ m.

a. Make a scale drawing of the park, with the scale 1 cm = 10 m. Measure $\angle ABC$ in your drawing. **[3]**

b. A second park, $\triangle PQR$, is similar to $\triangle ABC$, with $PQ = 45$ m corresponding to AB. How much fencing does it need to go once round it? **[2]**

Question 11 — 6 marks

a. How many faces does a tetrahedron have? **[1]**

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

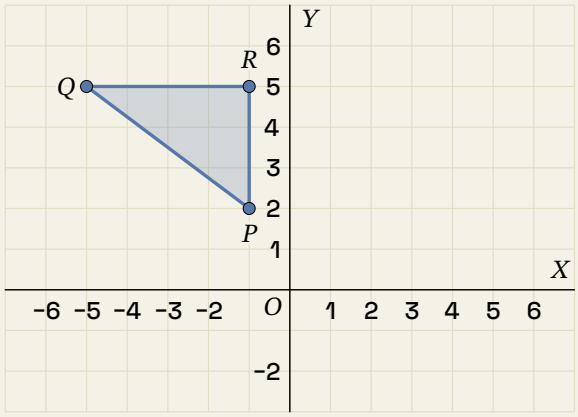


Figure 6 $\triangle PQR$ on a grid.

b. Find the length of the side PQ. **[2]**

c. Rotate $\triangle PQR$ about the origin through $-90\circ$. Draw the image on the same graph, and write the coordinates of P', Q' and R'. **[3]**

Question 12 — 3 marks

Ujwal asked the 240 students of his school in Nuwakot how they come to school. The pie chart shows the answers.

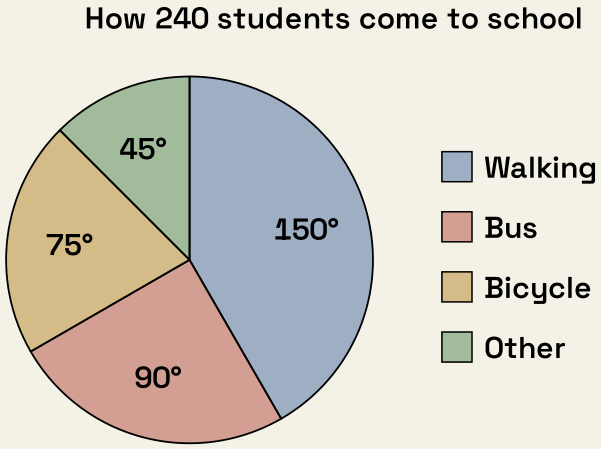


Figure 8 The answers of 240 students.

a. How many students walk to school? **[1]**

b. How many more students walk than come by bus? What percent of the students come by bus? **[2]**