Grade 8 Math, Explained

Unit 20 · Bearing and Scale Drawing

HARDER PRACTICE QUESTIONS

Full marks 27

Write your answers on separate paper. Show your working. Bearings have three digits. For a scale drawing, draw a north line at every place, and use a sharp pencil. All places and maps are made up for the problems.

1 Turning on the way [3]

A boy walks on a bearing of 070°. He turns 90° to his right and walks on, then turns 150° to his right and walks on.

i. What is his bearing after the first turn?
ii. What is his bearing after the second turn?
iii. In which compass direction, roughly, is he walking then?

2 Two places from one [3]

From a tower P, a village A is on a bearing of 040°, and a village B is on a bearing of 300°.

i. Find $\angle APB$, the smaller angle between the two directions.
ii. Find the bearing of P from A.
iii. Find the bearing of P from B.

3 A right-angled walk [4]

Lakpa walks 6 km on a bearing of 050° from A to B, then 8 km on a bearing of 140° from B to C.

i. Show that the angle at B in triangle ABC is 90°.
ii. Find the straight distance AC, by calculation.
iii. Make a scale drawing with 1 cm = 2 km, and measure the bearing of C from A.
iv. Find the bearing of A from C.

4 Lengths and areas on a map [3]

A map has the scale 1 : 50,000.

i. What real length does 1 cm on the map stand for, in km?
ii. A field is drawn as a rectangle 2 cm by 3 cm. Find its real area in km^2.
iii. Asmina says: “The map’s area is 6 cm^2, so the real area is 6×50000 cm^2.” Why is that wrong?

5 Redraw the plan [3]

On a plan with the scale 1 : 200, a room is 4.5 cm by 3 cm.

i. Find the real length and breadth of the room.
ii. The plan is redrawn at 1 : 150. What are the room’s measures on the new plan?
iii. Is the new drawing larger or smaller? Why?

6 Spot the error [3]

Each line has a mistake. Find it and correct it.

i. The bearing of a school from a temple is 280°, so the bearing of the temple from the school is 460°.
ii. A hill is due east of a camp, so its bearing from the camp is 90°.
iii. A scale of 1 : 500 means that 1 cm stands for 500 m.

7 In a real setting [4]

Two fire lookouts, A and B, stand 500 m apart, with B due east of A. A forest fire is on a bearing of 045° from A and 315° from B.

i. Make a scale drawing with 1 cm = 100 m, and mark the fire F.
ii. Find the angles of triangle ABF. What kind of triangle is it?
iii. How far is the fire from lookout A? Measure on your drawing.
iv. How far is the fire from the line AB?

8 Think [2]

Explain why the bearing back differs from the bearing there by exactly 180°. Draw two north lines, one at each place, and use what you know about parallel lines.

9 Make your own [2]

Make up a three-part walk with equal legs that ends where it began. Give each leg's bearing and length. Check it with a scale drawing. What must the angle between one leg's bearing and the next be, and why?