MATHEMATICS · GRADES 10-12

Bearings and navigation problems

Difficulty level: Advanced

Mathematics: Grades 10-12

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Overview of the concept

This is how pilots, sailors, and hikers describe a direction from north. A bearing of 060 degrees means the same thing to everyone reading the same compass, so a whole crew can follow it and end up in the same place. Without bearings, directions like over there or that way are too vague to navigate by.



Rule

Bearings: a bearing is a direction measured clockwise from north, always written with three digits.

North is 000, east is 090, south is 180, and west is 270.

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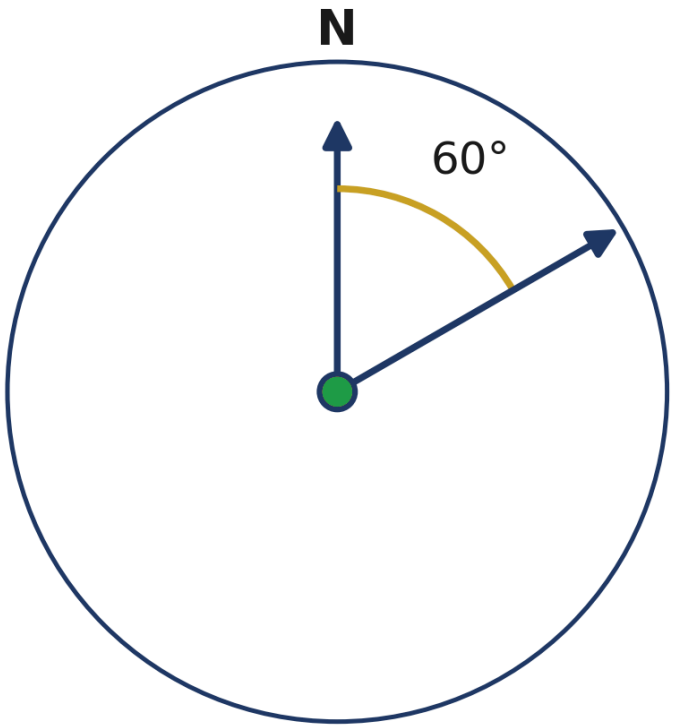
Worked examples

EXAMPLE 1

Q A ship sails on a bearing of 060 degrees. Draw the direction.



SOLUTION

Start by pointing north, straight up.

Turn clockwise toward east.

Stop after 60 degrees: the ship heads northeast, closer to east than north.

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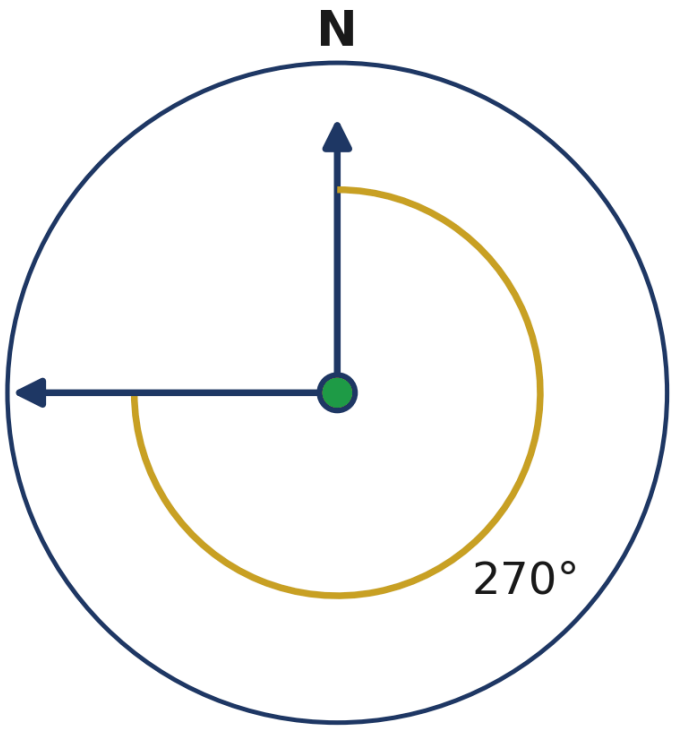
EXAMPLE 2

Q A bearing of 270 degrees points which way?



SOLUTION

Start pointing north and turn clockwise 270 degrees.

After 90 you face east, after 180 south, after 270 west.

The direction is due west.

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Practice questions

1 A ship sails on a bearing of 000 degrees. Which direction is it heading?

- **A** East
- **B** North
- **C** South
- **D** West

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2 A plane flies on a bearing of 090 degrees. Which direction is it heading?

- **A** North
- **B** South
- **C** East
- **D** West

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3 A hiker walks on a bearing of 180 degrees. Which direction is she heading?

- A South
- B East
- C North
- D West

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4 A cyclist rides on a bearing of 270 degrees. Which direction is he heading?

- A East
- B North
- C South
- D West

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5

A boat sails on a bearing of 045 degrees. Which way does it point?

A Northwest

B Southeast

C Northeast

D Southwest

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6

A sailor measures a bearing from north. Does she turn clockwise or counterclockwise?

A Counterclockwise

B Clockwise

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7 A bearing is written with how many digits?

- **A** Two
- **B** Four
- **C** Three
- **D** Five

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8 A runner heads out on a bearing of 135 degrees. Which way is she going?

- **A** Northeast
- **B** Southeast
- **C** Northwest
- **D** Southwest

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9 A ship sails on a bearing of 225 degrees. Which way is it heading?

- A Southeast
- B Northwest
- C Northeast
- D Southwest

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10 A plane flies on a bearing of 315 degrees. Which way is it heading?

- A Northwest
- B Northeast
- C Southeast
- D Southwest

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ANSWER KEY

1. North

2. East

3. South

4. West

5. Northeast

6. Clockwise

7. Three

8. Southeast

9. Southwest

10. Northwest

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