

Function Direction Map

Track how one quantity changes with another.

GRADE 8 • MA.8.F.1.3

MA.8.F.1.3 "Analyze a real-world written description or graphical representation of a functional relationship between two quantities and identify where the function is increasing, decreasing or constant."

NAME _____

DATE _____

READ THE CHANGES

Read a table or graph from left to right. If y goes up as x goes up, the function is increasing. If y goes down, it is decreasing. If y stays the same, it is constant.

WORKED EXAMPLE

Table: x : $\frac{1}{2}$, $\frac{3}{2}$, $\frac{5}{2}$, $\frac{7}{2}$; y : 41, 46, 46, 39. Identify each interval.

1. From $x=\frac{1}{2}$ to $x=\frac{3}{2}$, y rises from 41 to 46.
2. From $x=\frac{3}{2}$ to $x=\frac{5}{2}$, y stays at 46.
3. From $x=\frac{5}{2}$ to $x=\frac{7}{2}$, y falls from 46 to 39.

Answer: Increasing from $x=\frac{1}{2}$ to $x=\frac{3}{2}$, constant from $x=\frac{3}{2}$ to $x=\frac{5}{2}$, and decreasing from $x=\frac{5}{2}$ to $x=\frac{7}{2}$.

PRACTICE 5 problems

- 1** Table: x : 0, 1, 2, 3; y : 8, 12, 16, 20. Where is the function increasing?

ANSWER _____

- 2** Table: x : 2, 4, 6, 8; y : 14, 14, 14, 14. Where is the function constant?

ANSWER _____

- 3** Table: x : 1, 3, 5, 7; y : 30, 25, 25, 19. Identify the decreasing and constant intervals.

ANSWER _____

- 4** A drone's height rises from 9 a.m. to 11 a.m., stays unchanged until noon, then falls until 2 p.m. Identify each interval.

ANSWER _____

- 5** A graph connects (0, 6), (4, 18), (6, 18), and (10, 8) in order. Identify each interval.

ANSWER _____

APPLY IT Show your work

- 1** During a gaming event, a tablet battery drops from 80% at 3:00 to 60% at 4:00. It stays at 60% until 4:30, then charges to 90% by 5:00. Identify each interval.

WORK SPACE

ANSWER _____

- 2** On a bike trail, elevation rises from mile 0 to mile 2, stays level from mile 2 to mile 3, then descends from mile 3 to mile 5. Identify each interval.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A graph connects $(0, 3)$, $(2, 11)$, $(5, 4)$, $(7, 10)$, and $(9, 10)$ in order. Identify all increasing, decreasing, and constant intervals. Explain how the y -values show this.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Table: x : 0, 1, 2, 3; y : 8, 12, 16, 20. Where is the function increasing?	Increasing from $x=0$ to $x=3$.
2	Table: x : 2, 4, 6, 8; y : 14, 14, 14, 14. Where is the function constant?	Constant from $x=2$ to $x=8$.
3	Table: x : 1, 3, 5, 7; y : 30, 25, 25, 19. Identify the decreasing and constant intervals.	Decreasing from $x=1$ to $x=3$ and from $x=5$ to $x=7$; constant from $x=3$ to $x=5$.
4	A drone's height rises from 9 a.m. to 11 a.m., stays unchanged until noon, then falls until 2 p.m. Identify each interval.	Increasing from 9 a.m. to 11 a.m., constant from 11 a.m. to noon, and decreasing from noon to 2 p.m.
5	A graph connects (0, 6), (4, 18), (6, 18), and (10, 8) in order. Identify each interval.	Increasing from $x=0$ to $x=4$, constant from $x=4$ to $x=6$, and decreasing from $x=6$ to $x=10$.

PART 2 • APPLY IT

- Decreasing from 3:00 to 4:00, constant from 4:00 to 4:30, and increasing from 4:30 to 5:00.** Compare the battery percentages as time moves forward. They fall, stay equal, then rise.
- Increasing from mile 0 to mile 2, constant from mile 2 to mile 3, and decreasing from mile 3 to mile 5.**
Elevation increases on the uphill section, does not change on the level section, and decreases on the downhill section.

CHALLENGE

Increasing from $x=0$ to $x=2$ and from $x=5$ to $x=7$; decreasing from $x=2$ to $x=5$; constant from $x=7$ to $x=9$. The y -values rise, then fall, then rise, then stay the same as x increases.

Accept equivalent interval wording, such as "between $x=0$ and $x=3$." Students should identify changes as x moves from left to right or forward in time.