# Gradient

Mana Maths

# Te reo Māori terms

**rōnaki**
gradient
Open in Te Aka

**whanake**
rise
Open in Te Aka

**oma**
run
Open in Te Aka

**rōnaki**
slope
Open in Te Aka

# Gradient — Foundation

Use rise over run. Include the sign.

**1.** Rise $1$, run $1$. Gradient?

**2.** Rise $2$, run $1$. Gradient?

**3.** Fall $1$, run $1$. Gradient?

**4.** Fall $3$, run $1$. Gradient?

**5.** Gradient from $(0, 1)$ to $(1, 3)$.

**6.** Gradient from $(2, 4)$ to $(3, 6)$.

**7.** Gradient from $(1, 5)$ to $(2, 4)$.

**8.** Gradient from $(-1, 2)$ to $(0, -1)$.

**9.** Table $(0, 2)$, $(1, 4)$, $(2, 6)$, $(3,$ Gradient?

**10.** Table $(0, 7)$, $(1, 4)$, $(2, 1)$, $(3, 2)$. Gradient?

**11.** Pattern $6, 10, 14, 18, \ldots$. Change?

**12.** Pattern $15, 12, 9, 6, \ldots$. Change?

**13.** Does gradient $5$ go up or down?

**14.** Gradient of $y = 4$?

# Gradient — Proficient

Find gradients from points, tables, and patterns.

**1.** Gradient from $(1, 2)$ to $(5, 4)$.

**2.** Gradient from $(-2, 3)$ to $(2, -3)$.

**3.** Gradient from $(4, -1)$ to $(8, 5)$.

**4.** Gradient from $(-3, -2)$ to $(1, 0)$.

**5.** Rise $3$, run $2$. Gradient?

**6.** Fall $5$, run $4$. Gradient?

**7.** Rise $7$, run $5$. Gradient?

**8.** Fall $9$, run $2$. Gradient?

**9.** Table $(0, -1), (2, 2), (4, 5)$, Gradient?

**10.** Table $(6, 8), (1, -1), (1, 2), (1, 5)$, Gradient?

**11.** Pattern $-1, -2, -4, -5, \ldots$ Change?

**12.** Pattern $20, 18.5, 17, 15.5, 14, 12.5, 11, 9.5, \ldots$ Change?

# Gradient — Excellence

Work carefully with negative and fractional gradients.

**1.** Gradient from $(-3, -1)$ to $(5, 4)$.

**2.** Gradient from $(-4, 5)$ to $(2, -1)$.

**3.** Gradient from $(1, -2)$ to $(9, 3)$.

**4.** Gradient from $(-6, -4)$ to $(2, 6)$.

**5.** Rise $5$, run $2$. Gradient?

**6.** Fall $7$, run $3$. Gradient?

**7.** Rise $3$, run $4$. Gradient?

**8.** Fall $11$, run $5$. Gradient?

**9.** Table $(0, -3)$, $(4, 0)$, $(8, 3)$, ( Gradient?

**10.** Table $(-2, 7)$, $(2, 4)$, $(6, 1)$, $(10, -2)$. Gradient?

**11.** Table $(1, 2.5)$, $(3, 4)$, $(5, 5.5)$, Gradient?

**12.** Pattern $18, 13, 8, 3, \ldots$. Change?

**13.** Pattern $1, 1.75, 2.5, 3.25, \ldots$ Change?

**14.** Steeper: $\frac{3}{4}$ or $-2$?

**15.** Which goes down faster: $-\frac{5}{2}$ or $\frac{1}{2}$?

**16.** What does gradient $0$ look like?