# Gradient as rise/run

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

**1.** Find the gradient through $(1, 2)$ and $(4, 8)$. [2 marks]

$m = (8 - 2)/(4 - 1) = 6/3 = 2$.

**Answer:** 2

**2.** Find the gradient through $(-3, 5)$ and $(1, -3)$. [2 marks]

$m = (-3 - 5)/(1 - (-3)) = -8/4 = -2$.

**Answer:** $-2$

**3.** Find the gradient through $(2, -1)$ and $(6, 1)$. [2 marks]

$m = (1 + 1)/(6 - 2) = 2/4 = 1/2$.

**Answer:** $\frac{1}{2}$

**4.** Describe the gradient of the line $x = 4$. [2 marks]

Every point has the same $x$-coordinate.

The run is zero, so division by the run is not defined.

**Answer:** Undefined

**5.** A tank contains 80 L at 2 minutes and 50 L at 8 minutes. Find the average gradient and explain it. [3 marks]

$m = (50 - 80)/(8 - 2) = -30/6 = -5$.

The negative sign represents a decrease.

**Answer:** $-5$ L/min; the tank loses an average of 5 L per minute over this interval.

**6.** Two points on a line are $(-2, 3)$ and $(4, k)$. Its gradient is $2/3$. Find $k$. [3 marks]

$(k - 3)/(4 + 2) = 2/3$.

Thus $k - 3 = 4$, giving $k = 7$.

**Answer:** $k = 7$