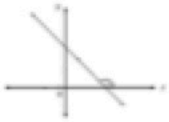
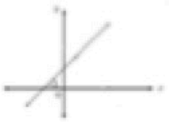
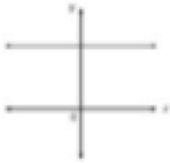
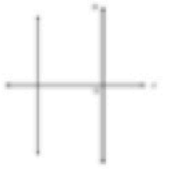
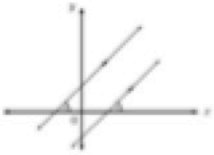
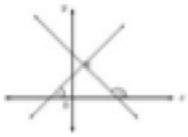
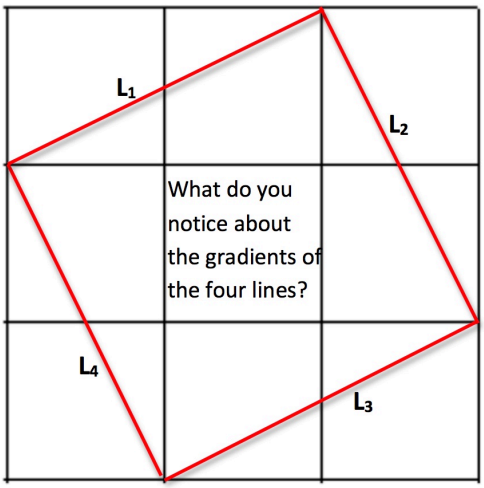
AIMSSEC

AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES
SCHOOLS ENRICHMENT CENTRE
TEACHER NETWORK

Column A	Column B	Column C
1 	A Two parallel lines.	P $m = 0$
2 	B Horizontal line (parallel to the x-axis)	Q $m_1 \times m_2 = -1$
3 	C A line going upwards from left to right (in a north easterly direction).	R $m < 0$
4 	D Two perpendicular lines.	S $m_1 = m_2$
5 	E A line going downwards from left to right (in a south easterly direction).	T m is undefined
6 	F Vertical line (parallel to the y-axis).	U $m > 0$

LINE MATCH



Explain your findings about the four lines in the diagram above and their gradients.

Match each sketch graph from column A with a description and a fact about gradients from the other two columns.

SOLUTION

1 E R

2 C U

3 B P

4 F T

5 A S

6 D Q

NOTES FOR TEACHERS

Diagnostic Assessment This should take about 5–10 minutes.

1. Write the question on the board, say to the class:
   "Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".
2. Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
4. **Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.** It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

The coordinate (3, 2) is on a line which is parallel to the x-axis. Which line is it?

A $y = 3$ B $y = 2$

C $x = 2$ D $x = 3$

B. is the correct answer.

Common Misconceptions

A. C. or D.

To give any of these answers shows that the learner is confused between x and y and does not understand why lines parallel to the x axis have equation y = constant and lines parallel to the y axis have equation x = constant.
https://diagnosticquestions.com

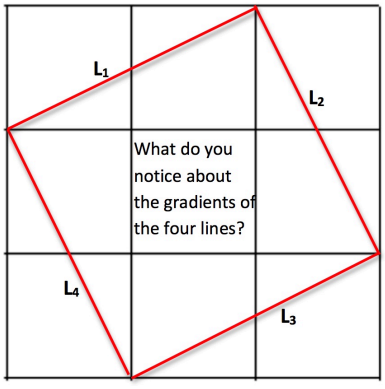
Why do this activity?

This could be a very short lesson starter activity to review the topic or it could be used as an introduction to the equations of lines parallel to the axes.

Intended learning outcomes

For learners to understand the significance of the gradient of a line being positive, negative, zero or undefined, why gradients of parallel lines are equal and why the product of the gradients of perpendicular lines is -1.

Suggestions for teaching



You could start with this diagram and ask the learners what they notice about the gradients of the four lines and to explain what they see.

The learners could then work in groups of three. Each group could be given a copy of the table (see page 4) and a pair of scissors. If you collect the cards after the lesson you could use them again for another class.

Ask the learners to match the cards. Then for each set of cards, get a different group to come to the board and to explain why they have matched those cards.

Key questions

Is that gradient positive or negative? Why?
What can you say about the gradient of that line?
What can you say about the gradients of parallel lines. Can you explain why that happens?
What can you say about the gradients of perpendicular lines. Can you explain why that happens?
If the gradient of a line is 0 what does that tell you about the line? Why?
If the gradient of a line is undefined what does that tell you about the line? Why?

Possible extension

The lesson activity Lines could be the next challenge.
https://aiminghigh.aimssec.ac.za/grades-10-and-11-lines/

Possible support

The learners could do the lesson activity Steps before the Line Match activity.
https://aiminghigh.aimssec.ac.za/grades-7-to-9-steps/

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. **Note:** The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is **not** included in the school curriculum for Grade 12 SA.				
	Lower Primary or Foundation Phase **Age 5 to 9**	**Upper Primary** **Age 9 to 11**	**Lower Secondary** **Age 11 to 14**	**Upper Secondary** **Age 15+**
South Africa	**Grades R and 1 to 3**	**Grades 4 to 6**	**Grades 7 to 9**	**Grades 10 to 12**
USA	**Kindergarten and G1 to 3**	**Grades 4 to 6**	**Grades 7 to 9**	**Grades 10 to 12**
UK	**Reception and Years 1 to 3**	**Years 4 to 6**	**Years 7 to 9**	**Years 10 to 13**
East Africa	**Nursery and Primary 1 to 3**	**Primary 4 to 6**	**Secondary 1 to 3**	**Secondary 4 to 6**

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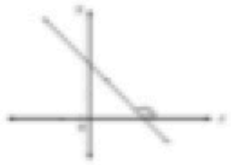
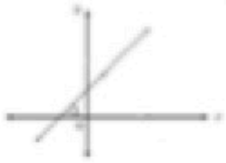
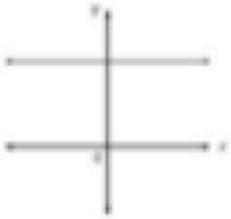
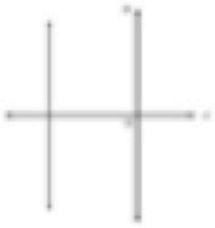
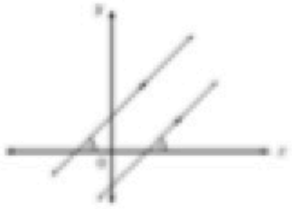
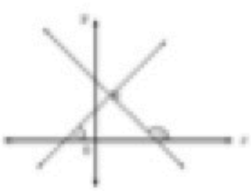
1 	A Two parallel lines.	P $m = 0$
2 	B Horizontal line (parallel to the x-axis)	Q $m_1 \times m_2 = -1$
3 	C A line going upwards from left to right (in a north easterly direction).	R $m < 0$
4 	D Two perpendicular lines.	S $m_1 = m_2$
5 	E A line going downwards from left to right (in a south easterly direction).	T m is undefined
6 	F Vertical line (parallel to the y-axis).	U $m > 0$