Gradient midpoint and distance

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A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Calculate the gradient, midpoint and distance between two points.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

For points (x1, y1), (x2, y2), gradient=(y2-y1)/(x2-x1), provided x2≠x1. Midpoint averages corresponding coordinates.

Distance follows Pythagoras:$\sqrt{((x2-x1)^2+(y2-y1)^2)}$. Distance is non-negative; gradient can be positive, negative, zero or undefined.

Worked example

For A(1,2), B(7,10), find gradient, midpoint and distance.

Changes are 6 and 8, so slope 8/6=4/3.

Midpoint (4,6); distance $\sqrt{(36+64)}=10$.

Answer: 4/3; (4,6); 10 units

Try it yourself

Name: _____ Date: _____

1. Find gradient through (2,1), (6,9).

2. Find midpoint of (-2,5), (4,1).

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 2

Rise 8/run 4.

2. (1,3)

Average x values and y values.

Curriculum reference: VC2M9A04

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