23 / 3 / 16

Straight Lines - Lesson 1

Investigating Gradients

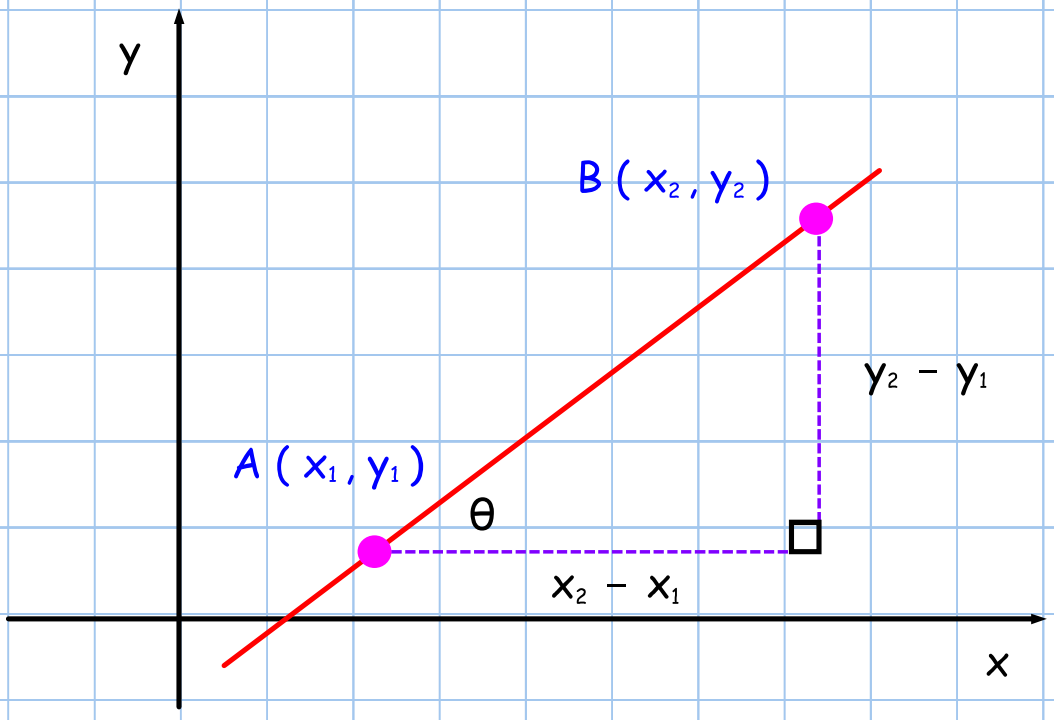
LI

- Calculate gradients in 2 ways.
- Calculate the angle a line makes with the + ve x - axis.

SC

- Simplify fractions.
- Use a calculator.

Jan 10-12:11



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\tan\theta = \frac{y_2 - y_1}{x_2 - x_1}$$

$\therefore$ $m = \tan\theta$

θ is the angle the line makes with the positive x-axis

Jun 5-12:32

Example 1

A line makes an angle of 37.9° with the positive x-axis.

Calculate its gradient (to 2 d.p.).

$$m = \tan\theta$$

$$m = \tan 37.9^\circ$$

$$\boxed{m = 0.78}$$

Mar 3-16:58

Example 2

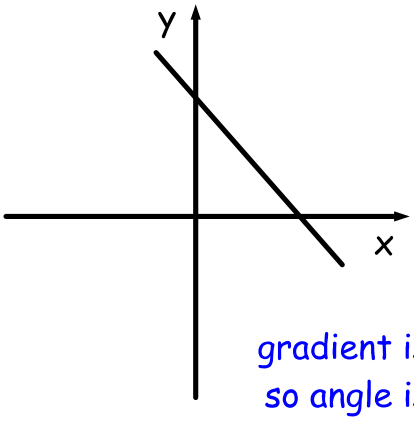
Calculate the angle (in radians) a line with gradient -4 makes with the positive x-axis (to 2 d.p.).

$$m = \tan\theta$$

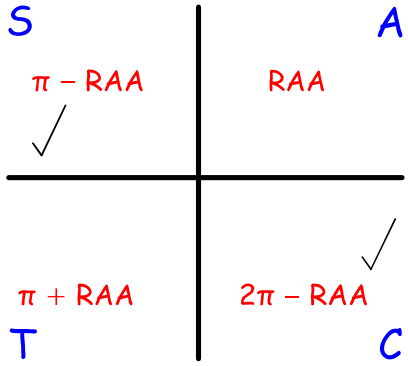
$$-4 = \tan\theta$$

$$RAA = \tan^{-1} 4$$

$$RAA = 1.325\ldots$$



gradient is negative, so angle is between 0 and π radians; hence, $\pi - RAA$



$$\therefore \quad \theta = \pi - 1.325\ldots$$

$$\Rightarrow \quad \theta = 3.141\ldots - 1.325\ldots$$

$$\Rightarrow \quad \boxed{\theta = 1.82}$$

Mar 3-16:58

CfE Higher Maths

pg. 300 - 1 Ex. 13D All Q

Oct 29-09:14