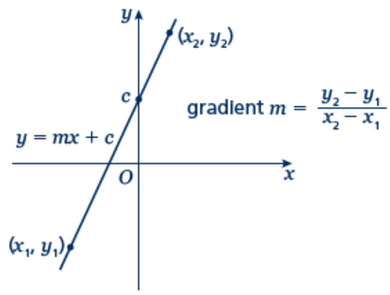
Pearson Edexcel

Distance between two points

A LEVEL LINKS
Scheme of work: 2a. Straight-line graphs, parallel/perpendicular, length and area problems

Key points

- A straight line has the equation $y = mx + c$, where m is the gradient and c is the y-intercept (where $x = 0$).
- The equation of a straight line can be written in the form $ax + by + c = 0$, where a, b and c are integers.
- When given the coordinates (x_1, y_1) and (x_2, y_2) of two points on a line the gradient is calculated using the formula $m = \dfrac{y_2 - y_1}{x_2 - x_1}$



Practice questions

1 (a) Factorise completely $9x - 4x$

(b) Sketch the curve C with equation

$$y = 9x - 4x^3$$

Show on your sketch the coordinates at which the curve meets the x–axis.

The points A and B lie on C and have x coordinates of –2 and 1 respectively.

(c) Show that the length of AB is $k\sqrt{10}$ where k is a constant to be found.

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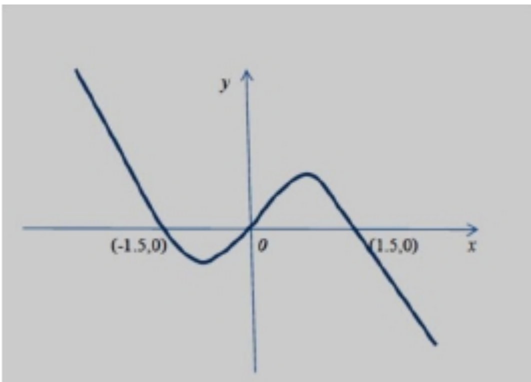
Answers

1 (a) $9x-4x^3=x(9-4x^2)$ or $-x(4x^2-9)$

$9-4x^2=(3+2x)(3-2x)$ or
$4x^2-9=(2x-3)(2x+3)$

$9x-4x^3=x(3+2x)(3-2x)$

(b)



(c) $A=(-2,14),\quad B=(1,5)$

$(AB=)\sqrt{(-2-1)^2+(14-5)^2}\left(=\sqrt{90}\right)$

E.g. $AB=\sqrt{(-2+1)^2+(14-5)^2}$

However $AB=\sqrt{(y_2-y_1)^2+(x_2-x_1)^2}=\sqrt{(-2+1)^2+(14-5)^2}$

$(AB=)3\sqrt{10}$