## Equation Of A Line


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8 The point $A$ has co-ordinates $(-4,6)$ and the point $B$ has co-ordinates $(7,-2)$.
Calculate the length of the line $A B$.


The diagram shows the straight line, $l$, which passes through the points $(0,3)$ and $(4,11)$.
(a) Find the equation of line $l$ in the form $y=m x+c$.

$$
\text { Answer(a) } y=
$$

(b) Line $p$ is perpendicular to line $l$.

Write down the gradient of line $p$.

(a) Work out the gradient of the line $L$.
(b) Write down the equation of the line parallel to the line $L$ that passes through the point $(0,6)$.

5


The equation of the line $l$ in the diagram is $y=5-x$.
(a) The line cuts the $y$-axis at $P$.

Write down the co-ordinates of $P$.
Answer(a) (..................... , .....................) [1]
(b) Write down the gradient of the line $l$.


Point $A$ has co-ordinates $(3,6)$.
(a) Write down the co-ordinates of point $B$.
$\qquad$
(b) Find the gradient of the line $A B$.
$\qquad$
(c) Find the equation of the line that

- is perpendicular to the line $A B$
and
- passes through the point $(0,2)$.

7 (a) The co-ordinates of $P$ are $(-4,-4)$ and the co-ordinates of $Q$ are $(8,14)$.
(i) Find the gradient of the line $P Q$.

> Answer(a)(i)
[2]
(ii) Find the equation of the line $P Q$.

## Answer(a)(ii)

[2]
(iii) Write $\overrightarrow{P Q}$ as a column vector.

$$
\begin{equation*}
\text { Answer(a)(iii) } \quad \overrightarrow{P Q}=( \tag{1}
\end{equation*}
$$

(iv) Find the magnitude of $\overrightarrow{P Q}$.
$18 \quad A(5,23)$ and $B(-2,2)$ are two points.
(a) Find the co-ordinates of the midpoint of the line $A B$.

Answer(a) (............ ............) [2]
(b) Find the equation of the line $A B$.

Answer(b)
[3]
(c) Show that the point $(3,17)$ lies on the line $A B$.

Answer(c)

7 (a) The co-ordinates of $P$ are $(-4,-4)$ and the co-ordinates of $Q$ are $(8,14)$.
(i) Find the gradient of the line $P Q$.

> Answer(a)(i)
[2]
(ii) Find the equation of the line $P Q$.

## Answer(a)(ii)

[2]
(iii) Write $\overrightarrow{P Q}$ as a column vector.

$$
\begin{equation*}
\text { Answer(a)(iii) } \quad \overrightarrow{P Q}=( \tag{1}
\end{equation*}
$$

(iv) Find the magnitude of $\overrightarrow{P Q}$.

17 (a) Find the co-ordinates of the midpoint of the line joining $A(-8,3)$ and $B(-2,-3)$.
(b) The line $y=4 x+c$ passes through $(2,6)$.

Find the value of $c$.

$$
\begin{equation*}
\text { Answer(b) } c= \tag{1}
\end{equation*}
$$

(c) The lines $5 x=4 y+10$ and $2 y=k x-4$ are parallel.

Find the value of $k$.

$$
\text { Answer(c) } k=
$$

9 A line joins the points $A(-2,-5)$ and $B(4,13)$.
(a) Calculate the length $A B$.

$$
\begin{equation*}
A B= \tag{3}
\end{equation*}
$$

(b) Find the equation of the line through $A$ and $B$. Give your answer in the form $y=m x+c$.

$$
y=
$$

(c) Another line is parallel to $A B$ and passes through the point $(0,-5)$.

Write down the equation of this line.
(d) Find the equation of the perpendicular bisector of $A B$.

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8 A line $A B$ joins the points $A(3,4)$ and $B(5,8)$.
(a) Write down the co-ordinates of the midpoint of the line $A B$.

> Answer(a) ( .................. ,................. ) [2]
(b) Calculate the distance $A B$.

$$
\text { Answer(b) } A B=
$$

(c) Find the equation of the line $A B$.

Answer(c)
(d) A line perpendicular to $A B$ passes through the origin and through the point $(6, r)$.

Find the value of $r$.

Answer(d) $r=$

20 (a) The two lines $y=2 x+8$ and $y=2 x-12$ intersect the $x$-axis at $P$ and $Q$.
Work out the distance $P Q$.

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Use

$$
\text { Answer (a) } P Q=
$$

(b) Write down the equation of the line with gradient -4 passing through $(0,5)$.

## Answer(b)

(c) Find the equation of the line parallel to the line in part (b) passing through $(5,4)$.

Answer (c)
[3]

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$A(5,10)$ and $B(13,-2)$ are two points on the line $A B$.
The perpendicular bisector of the line $A B$ has gradient $\frac{2}{3}$.
Find the equation of the perpendicular bisector of $A B$.

