

## Examples

Parallel Lines



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Perpendicular Lines



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Parallel Lines



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Perpendicular Lines



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## Workout

Question 1: Write down the equation of a line parallel to each of the following

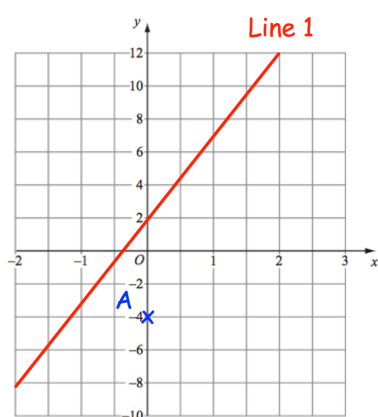
- |                    |                      |                      |                       |
|--------------------|----------------------|----------------------|-----------------------|
| (a) $y = 2x + 3$   | (b) $y = 5x - 3$     | (c) $y = -3x + 1$    | (d) $y = x - 7$       |
| (e) $y = -7x - 10$ | (f) $y = -x$         | (g) $y = 10x$        | (h) $y = 4$           |
| (i) $x + y = 5$    | (j) $2x + y - 1 = 0$ | (k) $x - 2y + 5 = 0$ | (l) $3x - 4y - 9 = 0$ |

Question 2: Write down the equation of each of the following lines

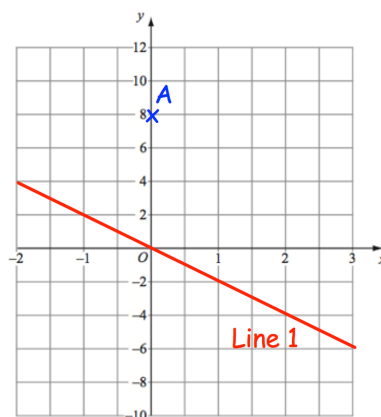
- Parallel to  $y = 3x + 5$  and passing through  $(0, 2)$
- Parallel to  $y = 4x - 1$  and passing through  $(0, 6)$
- Parallel to  $y = 5x$  and passing through  $(0, -3)$
- Parallel to  $y = -2x + 10$  and passing through the origin
- Parallel to  $x + y = 8$  and passing through  $(0, -4)$
- Parallel to  $x - 2y + 3 = 0$  and passing through  $(0, 5)$

Question 3: Write down the equation of the line parallel to Line 1 and passing through A.

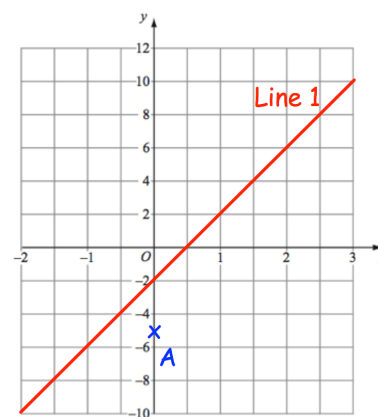
(a)



(b)



(c)



Question 4: Write down the equation of each of the following lines

- (a) Parallel to  $y = 2x - 1$  and passing through  $(1, 8)$
- (b) Parallel to  $y = 3x + 2$  and passing through  $(1, 1)$
- (c) Parallel to  $y = 5x - 4$  and passing through  $(2, 9)$
- (d) Parallel to  $y = 3x - 7$  and passing through  $(4, 15)$
- (e) Parallel to  $y = 4x$  and passing through  $(-1, 3)$
- (f) Parallel to  $y = -2x + 5$  and passing through  $(-3, 0)$
- (g) Parallel to  $y = 6x + 3$  and passing through  $(10, 5)$
- (h) Parallel to  $y = -\frac{1}{2}x + 1$  and passing through  $(3, 0)$
- (i) Parallel to  $x + y = 10$  and passing through  $(4, 0)$
- (j) Parallel to  $x - 3y - 6 = 0$  and passing through  $(-9, -2)$

Question 5: Write down the negative reciprocal of each number below.

- (a) 4
- (b)  $\frac{2}{3}$
- (c)  $-6$
- (d) 8
- (e)  $\frac{1}{2}$
- (f) 1
- (g)  $-\frac{1}{3}$
- (h)  $-\frac{2}{5}$
- (i)  $\frac{4}{7}$
- (j)  $1\frac{1}{2}$
- (k)  $-1$
- (l)  $-1\frac{3}{4}$

Question 6: Write down the equation of a line perpendicular to each of the following

- (a)  $y = 4x + 2$
- (b)  $y = 2x - 7$
- (c)  $y = -5x + 2$
- (d)  $y = x - 3$
- (e)  $y = -x + 1$
- (f)  $y = \frac{1}{2}x + 3$
- (g)  $y = \frac{3}{4}x - 2$
- (h)  $y = -\frac{1}{5}x + 1$
- (i)  $y = -\frac{2}{3}x - 5$
- (j)  $x + y = 12$
- (k)  $x - 2y + 8 = 0$
- (l)  $5x - 3y - 3 = 0$

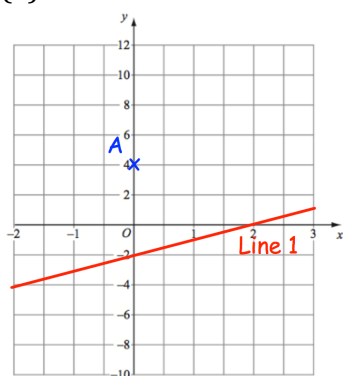
Question 7: Write down the equation of each of the following lines

- (a) Perpendicular to  $y = 2x + 4$  and passing through  $(0, 3)$
- (b) Perpendicular to  $y = -3x - 8$  and passing through  $(0, -2)$
- (c) Perpendicular to  $x + y = 6$  and passing through  $(0, 1)$

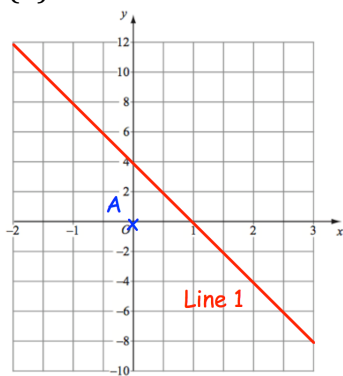
- (d) Perpendicular to  $y = \frac{1}{3}x - 2$  and passing through the origin
- (e) Perpendicular to  $y = -\frac{1}{5}x + 8$  and passing through  $(0, -2)$
- (f) Perpendicular to  $y = -\frac{2}{9}x - 10$  and passing through  $(0, 6)$

Question 8: Write down the equation of the line perpendicular to Line 1 & passing through A.

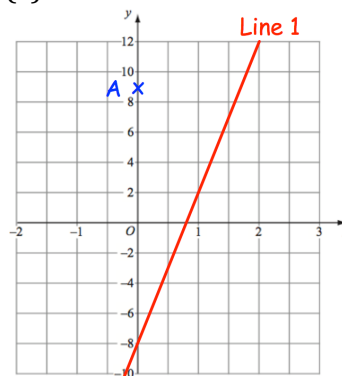
(a)



(b)



(c)



Question 9: Write down the equation of each of the following lines

- (a) Perpendicular to  $y = 2x - 1$  and passing through  $(4, 0)$
- (b) Perpendicular to  $y = -3x + 4$  and passing through  $(6, 1)$
- (c) Perpendicular to  $y = 4x$  and passing through  $(-12, 5)$
- (d) Perpendicular to  $y = -\frac{1}{2}x + 1$  and passing through  $(3, -7)$
- (e) Perpendicular to  $y = \frac{2}{3}x + 4$  and passing through  $(-6, -4)$
- (f) Perpendicular to  $y = -\frac{3}{5}x - 2$  and passing through  $(9, 9)$
- (g) Perpendicular to  $x + 4y - 6 = 0$  and passing through  $(1, 8)$

### Apply

Question 1: Write down the equations of the lines, from the box, that are:

$y = 2x$	$y = \frac{1}{2}x + 1$
$y = 3x + 2$	$y = -5x$
$y = 5x - 4$	$y = -2x + 3$
	$y = 3x - 2$

- (a) parallel                      (b) perpendicular                      (c) cross the y-axis at  $(0, 3)$
- (d) pass through the origin                      (e) pass through the point  $(1, 1)$

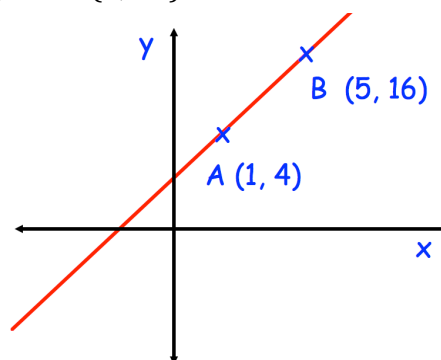
Question 2: Are the lines  $2x + y = 8$  and  $y = 2x + 5$  parallel?

Question 3: Are the lines  $4x - y - 5 = 0$  and  $x + 4y + 1 = 0$  perpendicular?

Question 4: A straight line passes through the points  $A(1, 4)$  and  $B(5, 16)$ .

(a) Find the equation of the line parallel to  $AB$  that passes through  $(1, 7)$

(b) Find the equation of the line perpendicular to  $AB$  that passes through the midpoint of  $AB$ .



Question 5: The line  $L$  has equation  $y = 2x + 8$   
The line  $L$  crosses the  $x$ -axis at the point  $A$ .  
The line  $M$  is perpendicular to Line  $L$  and passes through the point  $A$

- (a) Find the coordinates of the point  $A$ .  
(b) Find equation of the Line  $M$ .

Question 6: The point  $A$  has coordinates  $(-12, -7)$  and the point  $B$  has coordinates  $(-8, 1)$   
Find the equation of the line parallel to  $AB$  and passing through  $(2, 5)$

Question 7: The line  $L$  passes through the points  $(-2, 1)$  and  $(2, 3)$ .  
The line  $N$  passes through the points  $(4, 7)$  and  $(12, 11)$ .

Bryan says that the lines  $L$  and  $N$  are parallel.  
Is Bryan correct? Explain your answer.

Question 8: The point  $C$  has coordinates  $(2, -3)$  and the point  $D$  has coordinates  $(4, 6)$ .  
Find the equation of the line perpendicular to  $CD$  and passing through  $D$ .

Question 9: The line  $Q$  passes through the points  $(-10, -2)$  and  $(-8, -8)$   
The line  $R$  passes through the points  $(1, 2)$  and  $(10, a)$

The lines  $Q$  and  $R$  are perpendicular.

Find  $a$ .

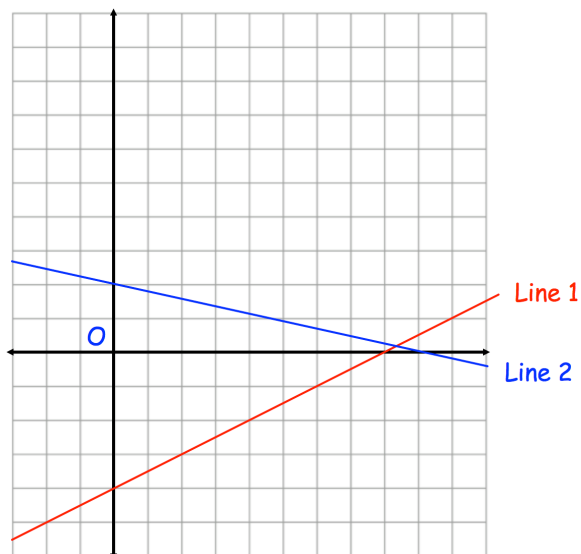
## Parallel and Perpendicular Lines

Videos 196 and 197 on [www.corbettmaths.com](http://www.corbettmaths.com)

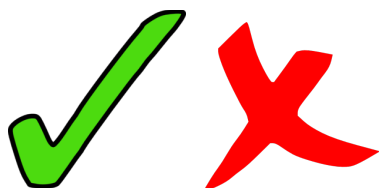
Question 10: Two straight lines are shown.

Line 1 has equation  $y = \frac{3}{2}x - 24$

- (a) Find the equation of Line 2
- (b) Are the lines perpendicular?



Answers



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