# Higher Check In - 7.02 Straight line graphs

1. Write down the equation of a line parallel to  that passes through the point (0, -4).
2. A line passes through (-2, 1) and (-4, -3). Find the equation of the line.
3. Which of the following lines are perpendicular to each other?

    

1. The diagram shows two parallel lines.



Find the equation of the line through CD.

1. Write down the solution set that is represented by the shaded area.



1. The equation of line L is . Explain how you know that the point (11, 39) lies above the line L.
2. Show that the line perpendicular to  that passes through the point (6, 3) intercepts the *y*-axis at .
3. Show that the equation of the perpendicular bisector of (-2, 1) and (4, -1) is .
4. The point with coordinates (*d*, 2*d*) lies on the straight line with equation . Find the value of *d*.
5. The equation of the tangent to the circle  at the point (-4, 3) has equation  where *a* and *b* are positive integers. Find the values of *a* and *b*.

**Extension**

The line  is reflected in the *x*-axis and then in the *y*-axis. What is the equation of the new line?

## Answers

1. 
2. 
3.  and 
4. 
5. 
6. Substituting  into the equation of L gives  which means (11, 35) lies on the line so (11, 39) must lie above the line.
7. A line perpendicular to  has gradient  and equation . If it passes through (6, 3) then substituting  and  gives  which simplifies to  so . The line intercepts the *y*-axis at 12.
8. Gradient of the line joining the two points  and the midpoint of the line is . If the perpendicular bisector has a gradient of 3 and passes through (1, 0) then substituting  and  gives  so .

The equation of the perpendicular bisector is .

1. **
2. **, 

**Extension**

After the two reflections the line has the equation .

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AO1 | 1 | Find the equation of a parallel line through a given point |  |  |  |  | AO1 | 1 | Find the equation of a parallel line through a given point |  |  |  |
| AO1 | 2 | Find the equation of a straight line through two given points |  |  |  |  | AO1 | 2 | Find the equation of a straight line through two given points |  |  |  |
| AO1 | 3 | Identify equations of perpendicular lines |  |  |  |  | AO1 | 3 | Identify equations of perpendicular lines |  |  |  |
| AO1 | 4 | Find the equation of a parallel line through a given point |  |  |  |  | AO1 | 4 | Find the equation of a parallel line through a given point |  |  |  |
| AO1 | 5 | Identify the solution set of a linear inequality in two variables |  |  |  |  | AO1 | 5 | Identify the solution set of a linear inequality in two variables |  |  |  |
| AO2 | 6 | Justify that a point lies above a line |  |  |  |  | AO2 | 6 | Justify that a point lies above a line |  |  |  |
| AO2 | 7 | Find the *y*-intercept of a perpendicular line that passes through a given point |  |  |  |  | AO2 | 7 | Find the *y*-intercept of a perpendicular line that passes through a given point |  |  |  |
| AO2 | 8 | Find the equation of a perpendicular bisector of two given points |  |  |  |  | AO2 | 8 | Find the equation of a perpendicular bisector of two given points |  |  |  |
| AO3 | 9 | Solve a problem involving an unknown point on a straight line |  |  |  |  | AO3 | 9 | Solve a problem involving an unknown point on a straight line |  |  |  |
| AO3 | 10 | Find the equation of a tangent to a circle at a given point |  |  |  |  | AO3 | 10 | Find the equation of a tangent to a circle at a given point |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
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