Instructor: Dr. R.A.G. Seely 3rd Practice Assignment

Algebra & Functions (Maths 201–016)

Lines in the Plane

Find an equation for the line through A and B:

1. $A = (0, 5), B = (1, 6)$
2. $A = (2, -5), B = (0, -3)$
3. $A = (5, -6), B = (2, -12)$
4. $A = (0, 0), B = (2, -4)$
5. $A = (-5, 5), B = (0, 0)$
6. $A = (-4, 5), B = (-4, 12)$
7. $A = (-3, 11), B = (1, 5)$
8. $A = (-1, 5), B = (0, 5)$
9. $A = (-3, -12), B = (1, -14)$
10. $A = (3, -11), B = (5, -17)$
11. $A = (-5, 13), B = (10, 13)$
12. $A = (8, 5), B = (8, 0)$
13. $A = (5, -1), B = (3, 6)$

Find an equation for the line through A that is parallel to the line L:

14. $A = (0, 2), L : y = 3x + 1$
15. $A = (1, 5), L : y = -x + 11$
16. $A = (3, 2), L : y = -2x + 1$
17. $A = (5, 3), L : y = -7$
18. $A = (-2, 8), L : x = 1$
19. $A = (6, -2), L : x - 2y = 1$
20. $A = (-3, 1), L : 3x + 4y = 1$
21. $A = (-4, -4), L : x = 11$
22. $A = (0, 2), L : y = -3$

Find an equation for the line through A that is perpendicular to the line L:

23. $A = (0, -12), L : y = \frac{1}{3}x + 1$
24. $A = (2, 4), L : y = -\frac{1}{2}x - 3$
25. $A = (3, -3), L : 2x - 3y = 7$
26. $A = (5, 3), L : y = -7$
27. $A = (-2, 8), L : x = 1$
28. $A = (-5, 1), L : 5x + 4y = 1$
29. $A = (0, 0), L : -2x + 5y = 3$
30. $A = (1, 1), L : y = 6$
31. $A = (9, 0), L : x = 0$

For each of the following lines (a) find the slope, (b) find the x-intercept, (c) find the y-intercept, (d) sketch the line:

32. $y = -3x + 1$
33. $y = \frac{5}{3}x - 5$
34. $2x - y = 0$
35. $6x - 3y = 9$
36. $9x + 6y = 12$
37. $y = 3$

Determine whether the two lines are parallel, perpendicular, or neither:

38. $\begin{cases} x + y = 5 \\ x + y = 12 \end{cases}$
39. $\begin{cases} 2x - y = 1 \\ 3x + 2y = 7 \end{cases}$
40. $\begin{cases} -2x + y = 5 \\ 8x - 4y = 0 \end{cases}$
41. $\begin{cases} 4x + 3y = 2 \\ 3x - 4y = 1 \end{cases}$
42. $\begin{cases} -9x + 6y = 4 \\ 4x + 6y = -1 \end{cases}$

43. $\begin{cases} x + y = 5 \\ x - y = 0 \end{cases}$

44. $\begin{cases} 4x + 3y = 1 \\ 12x + 9y = 1 \end{cases}$

45. $\begin{cases} 2x - y = 11 \\ 4x + 2y = 10 \end{cases}$

46. $\begin{cases} y = -3 \\ x = 2 \end{cases}$

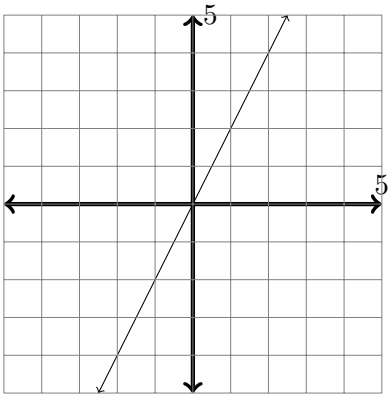
Find the point of intersection of the two lines: (Practice by using both methods: substitution and elimination.)

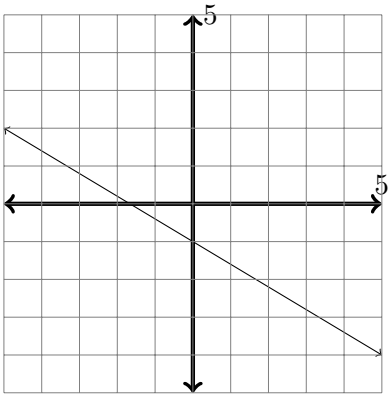
47. $\begin{cases} x + y = 4 \\ 3x + 2y = 12 \end{cases}$

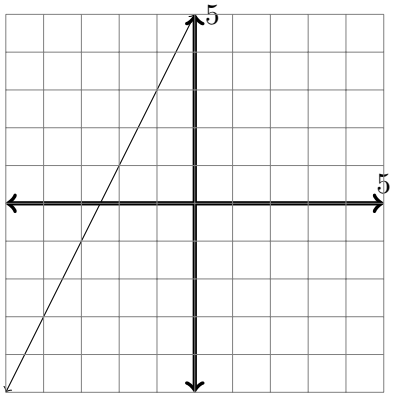
48. $\begin{cases} x - y = -4 \\ 5x + y = 16 \end{cases}$

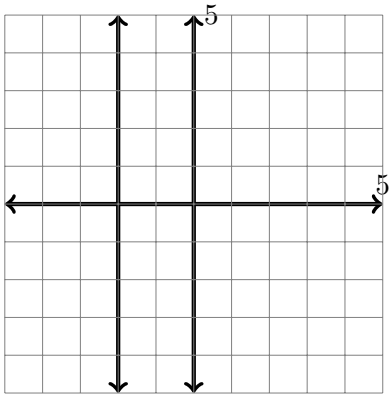
49. $\begin{cases} 3x + 5y = -7 \\ 4x + 3y = -2 \end{cases}$

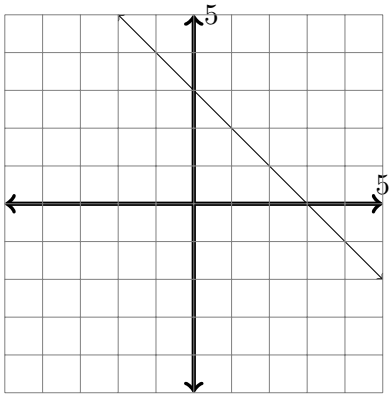
Find an equation for the line:

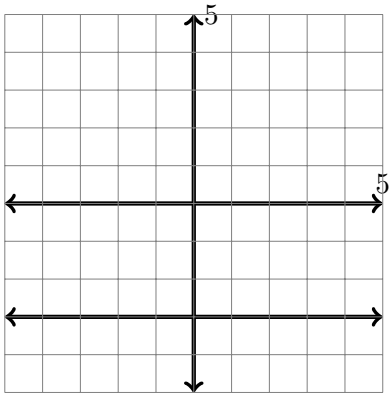
50. 

51. 

52. 

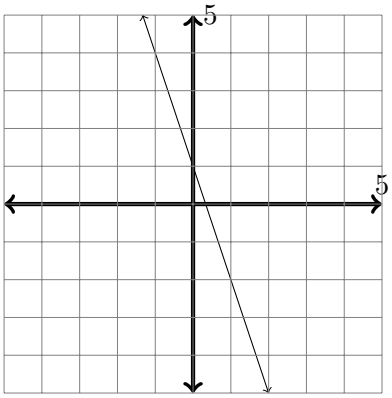
53. 

54. 

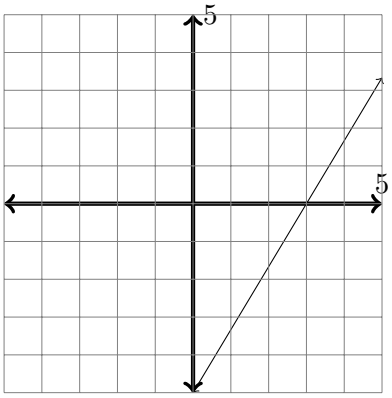
55. 

Answers

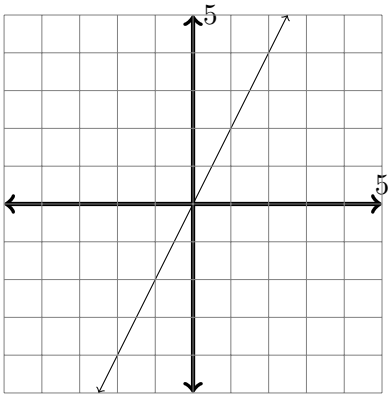
1. $y = x + 5$
2. $y = -x - 3$
3. $y = 2x - 16$
4. $y = -2x$
5. $y = -x$
6. $x = -4$
7. $y = \frac{13}{2} - \frac{3x}{2}$
8. $y = 5$
9. $y = -\frac{x}{2} - \frac{27}{2}$
10. $y = -3x - 2$
11. $y = 13$
12. $x = 8$
13. $y = \frac{33}{2} - \frac{7x}{2}$
14. $y = 3x + 2$
15. $y = 6 - x$
16. $y = 8 - 2x$
17. $y = 3$
18. $x = -2$
19. $y = \frac{x}{2} - 5$
20. $y = -\frac{3x}{4} - \frac{5}{4}$
21. $x = -4$
22. $y = 2$
23. $y = -3x - 12$
24. $y = 2x$
25. $y = \frac{3}{2} - \frac{3x}{2}$
26. $x = 5$
27. $y = 8$
28. $y = \frac{4x}{5} + 5$
29. $y = -\frac{5x}{2}$
30. $x = 1$
31. $y = 0$
32. $slope = -3, x = \frac{1}{3}, y = 1$



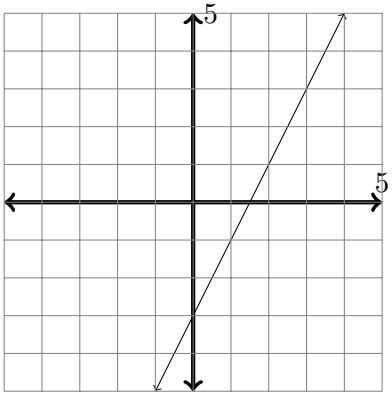
33. $slope = \frac{5}{3}, x = 3, y = -5$



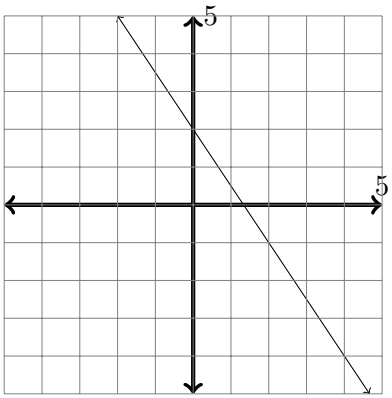
34. $slope = 2, x = 0, y = 0$



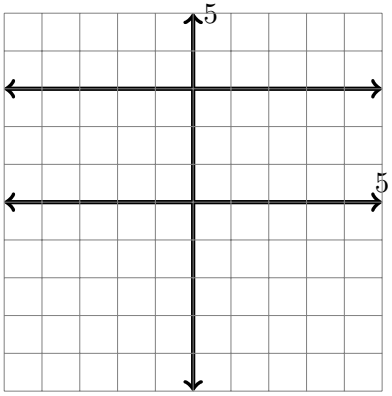
35. $slope = 2, x = \frac{3}{2}, y = -3$



36. $slope = -\frac{3}{2}, x = \frac{4}{3}, y = 2$



37. $slope = 0, x - int\ DNE, y = 3$



38. parallel
39. neither
40. parallel
41. perpendicular
42. perpendicular
43. perpendicular
44. parallel
45. neither
46. perpendicular
47. $(4, 0)$
48. $(2, 6)$
49. $(1, -2)$
50. $y = 2x$
51. $y = -\frac{3x}{5} - 1$
52. $y = 2x + 5$
53. $x = -2$
54. $y = -x + 3$
55. $y = -3$