Systems of Linear Equations - ANSWERS

E1 Exercises

1. system

3. Consistent

5. inconsistent

7. empty

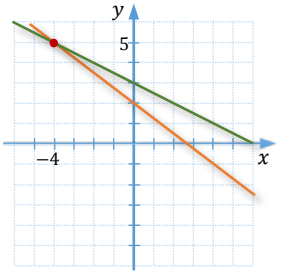
9. one

11. opposite

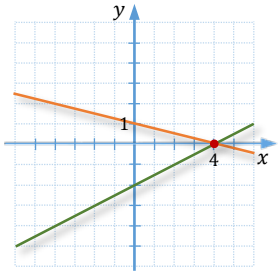
13. yes

15. no

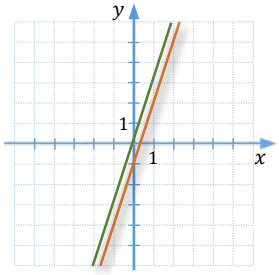
17. $(-4, 5)$
consistent;
independent



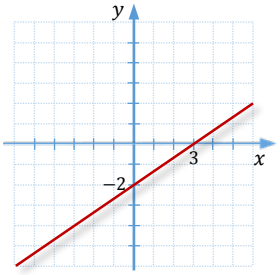
19. $(4, 0)$
consistent;
independent



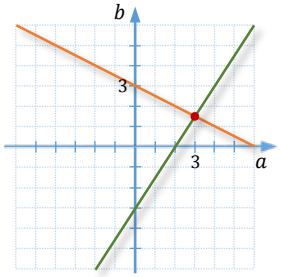
21. no solution;
inconsistent;
independent



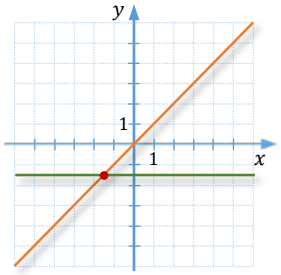
23. $\{(x, y) | 2x - 3y = 6\}$
consistent;
dependent



25. $\left(3, \frac{3}{2}\right)$
consistent;
independent



27. $\left(-\frac{3}{2}, -\frac{3}{2}\right)$
consistent;
independent



29. $(-1, -1)$

31. $\left(\frac{7}{3}, \frac{1}{3}\right)$

33. no solution;
parallel lines

35. $(5, 1)$

37. $(4, 6)$

39. $(4.2, -4.4)$

41. $(12, 8)$

43. $(4, -1)$

45. $(-1, 1)$

47. infinitely many
solutions; same line

49. $\left(\frac{140}{13}, -\frac{50}{13}\right)$

51. $\left(\frac{10}{21}, \frac{11}{14}\right)$

53. There are infinitely many other solutions. Any point satisfying the equation $5x + 3y = 14$ is a solution. For example, $(-2, 8)$ is another solution.

55. $\begin{cases} y = -\frac{2}{3}x + \frac{1}{3} \\ y = -\frac{2}{3}x + \frac{1}{3} \end{cases}$, infinitely many solutions **57.** $(-3, 2)$ **59.** $(9, 4)$

61. infinitely many solutions: $\{(x, y) | x + 2y = 48\}$ **63.** $\left(\frac{2}{3}, \frac{1}{3}\right)$ **65.** $\left(-5, -\frac{5}{3}\right)$

67. $(0,\ 4)$ **69.** $\left(\frac{1}{a}, \frac{1}{b}\right)$ **71.** $\left(-\frac{3}{5a}, \frac{7}{5}\right)$ **73.** $[0, 30)$

75. 2017 **77.** since 2006; ~7%

E2 Exercises

1. 8 liters **3.** $9.25n$ **5.** $r + c; r - c$ **7.** $69°, 21°$

9. base = 154 cm; heigth = 77 cm **11.** 35 km

13. 13 gold; 11 silver; 9 bronze **15.** 113 espressos; 339 cappuccinos

17. 322 adult tickets; 283 youth tickets **19.** 2.49 $/egg salad sandwich; 3.99 $/meat sandwich

21. 416 $/week in New York; 340 $/week in Paris **23.** $2300 at 3.25%; $2500 at 2.75%

25. $3200 at 3.7%; $2800 at 8.2% **27.** 9 L of 4% brine; 3 L of 20% brine

29. $66\frac{2}{3}$ g of cottage cheese; 40 g of vanilla yogurt **31.** 5 loonies; 9 quarters

33. houseboat: 12 km/h; current: 3 km/h **35.** plane: 275 km/h; wind: 25 km/h

37. plane: 315 km/h; wind: 45 km/h **39.** 480 km **41.** 0.7 L