

**CHAPTER 7 Simultaneous Equations**

This chapter concentrates on solution by elimination. Matrix solution of simultaneous equations is in Chapter 8.

**EXERCISE 7a (p. 119)**

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|---------|----------|----------------------|------------|
| 1. 3, 2 | 4. 1, 7  | 7. -2, 1             | 10. 6, 0   |
| 2. 2, 4 | 5. 4, -3 | 8. 5, 1              | 11. -1, -2 |
| 3. 3, 5 | 6. 2, 5  | 9. $3, 1\frac{1}{2}$ | 12. 0, 9   |

**EXERCISE 7b (p. 120)**

When using addition to eliminate it is usually easier to eliminate the second letter, but common-sense is needed!

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

**EXERCISE 7c (p. 123)**

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|---------------------|------------|----------|----------------------|
| 1. 3, 1             | 4. -12, 27 | 7. 1, 2  | 10. 0, 3             |
| 2. 1, 2             | 5. 0, 1    | 8. 2, 1  | 11. 1, -1            |
| 3. $\frac{1}{3}, 1$ | 6. 4, 3    | 9. 3, -1 | 12. $3, \frac{1}{2}$ |

**EXERCISE 7d (p. 124)**

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|----------------------|----------------------|------------|------------------------|
| 1. 3, 2              | 8. 1, 1              | 15. 3, -2  | 22. 8, 4               |
| 2. 1, 5              | 9. 2, 2              | 16. 2, -2  | 23. -3, 4              |
| 3. 3, 1              | 10. 3, -1            | 17. 0, 4   | 24. $3, -3\frac{1}{2}$ |
| 4. $1\frac{1}{2}, 0$ | 11. 4, 2             | 18. -1, -2 | 25. 3, 4               |
| 5. 0, 6              | 12. -3, 0            | 19. 1, 1   | 26. 2, 5               |
| 6. 3, -1             | 13. $2, \frac{2}{3}$ | 20. 3, 1   | 27. 3, 2               |
| 7. 1, 4              | 14. -1, 2            | 21. 2, -1  | 28. -1, -3             |

**EXERCISE 7e (p. 125)**

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|----------|-----------|---------------------------------|------------|
| 1. 1, 4  | 4. 6, 28  | 7. $3\frac{1}{2}, 2\frac{1}{2}$ | 10. 0, 4   |
| 2. -1, 5 | 5. 2, 3   | 8. 1, -2                        | 11. 3, 1   |
| 3. 3, -2 | 6. -1, -1 | 9. 5, 0                         | 12. -4, -5 |

**EXERCISE 7f (p. 126)**

Can be omitted.

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|---------|----------|---------------------------------|----------------------------------|
| 1. 2, 4 | 4. -2, 7 | 7. 1, 10                        | 10. -12, -4                      |
| 2. 5, 3 | 5. 4, 6  | 8. $2\frac{1}{3}, -\frac{2}{3}$ | 11. 2, 6                         |
| 3. 1, 1 | 6. 1, 1  | 9. -1, 5                        | 12. $4\frac{1}{2}, 7\frac{1}{2}$ |

**EXERCISE 7h (p. 128)**

Most children find these difficult. Only the most able should work from Number 7 onwards on their own.

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|----------|--------------|-----------------------------------------|
| 1. 12, 8 | 6. 11, 5     | 11. Harry 32, Adam 10, Sam 20           |
| 2. 11, 5 | 7. 3, 7      | 12. 3, 5                                |
| 3. 8, 2  | 8. 54, 36    | 13. $AB = 9\frac{1}{2}$ cm, $BC = 6$ cm |
| 4. 10, 3 | 9. 60p, 45p  | 14. $m = 2, c = 4, y = 2x + 4$          |
| 5. 10, 6 | 10. 25p, 10p |                                         |

**EXERCISE 7i (p. 131)**

The graphical solution of linear simultaneous equations is not a satisfactory method (it takes too long) but the idea is needed later for solving non-linear equations. The use of graph paper is essential for this exercise as most of the solutions are fractional (integer solutions can often be spotted when the tables are being made). A graphics calculator or a computer with graph-drawing software (with zoom facility) can be used to show how accurate and quick this method can be with appropriate tools.

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|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 1. $1\frac{1}{2}, 4\frac{1}{2}$ | 4. $-\frac{1}{2}, 1\frac{1}{2}$ | 7. $2\frac{2}{5}, 1\frac{4}{5}$ | 10. $\frac{1}{3}, 1\frac{2}{3}$ |
| 2. $1\frac{1}{3}, 3\frac{2}{3}$ | 5. $\frac{1}{2}, 2$             | 8. $-\frac{2}{5}, 1\frac{3}{5}$ |                                 |
| 3. $1\frac{1}{2}, 5\frac{1}{2}$ | 6. $1\frac{1}{2}, 3\frac{1}{2}$ | 9. $2\frac{2}{5}, 1\frac{1}{5}$ |                                 |