

CHAPTER 21 More Algebra

This work should be done only with above average ability children and even then it can be left until later. The work in this chapter is repeated in Book 2A.

EXERCISE 21a (p. 309)

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|--------------|---------------|---------------|---------------|----------------|
| 1. $2x + 2$ | 4. $12x - 12$ | 7. $5a + 5b$ | 9. $18 - 12x$ | 11. $14 - 7x$ |
| 2. $9x - 6$ | 5. $8 + 10x$ | 8. $16x - 12$ | 10. $5x - 5$ | 12. $24 - 16x$ |
| 3. $5x + 30$ | 6. $12 + 10a$ | | | |

EXERCISE 21b (p. 309)

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|---------------|---------------|----------------|--------------|----------------|
| 1. $6x + 4$ | 5. $4x + 17$ | 9. $5x + 5$ | 13. $6c - 2$ | 17. $2 - 12x$ |
| 2. $10x + 18$ | 6. $6x - 15$ | 10. $3x + 3$ | 14. $x - 8$ | 18. $38 - 10w$ |
| 3. $3x + 7$ | 7. $5x + 23$ | 11. $-3x - 8$ | 15. $7 - 8x$ | 19. $-3y - 12$ |
| 4. $14x - 18$ | 8. $17x - 23$ | 12. $-15 - 4x$ | 16. $6a - 6$ | 20. $2 - 15z$ |

Multiplication of directed numbers: can be introduced in many ways. When this work is done with average ability children they will probably benefit from a more practical approach.

EXERCISE 21c (p. 311)

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|----------|-----------|-----------|-----------|-----------|
| 1. -15 | 7. -18 | 13. -35 | 19. $+3$ | 25. -24 |
| 2. -8 | 8. $+16$ | 14. $+24$ | 20. -8 | 26. -24 |
| 3. $+14$ | 9. -5 | 15. -15 | 21. -6 | 27. $+45$ |
| 4. $+4$ | 10. $+18$ | 16. -45 | 22. $+15$ | 28. -20 |
| 5. -42 | 11. $+27$ | 17. -24 | 23. -18 | 29. -28 |
| 6. $+12$ | 12. -16 | 18. $+8$ | 24. $+20$ | 30. $+36$ |

EXERCISE 21d (p. 312)

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|----------------|----------------|-----------------|-----------------|-------------------|
| 1. $-6x + 30$ | 7. $-6d + 6$ | 13. $6x - 18$ | 19. $20x - 5$ | 25. $-5a - 5b$ |
| 2. $-15c - 15$ | 8. $-8 - 4x$ | 14. $-14 - 7x$ | 20. $-5 + 20x$ | 26. $6x + 4y + 2$ |
| 3. $-10e + 6$ | 9. $-14 + 21x$ | 15. $-6x + 2$ | 21. $24 + 30x$ | 27. $-25 - 10x$ |
| 4. $-3x + 4$ | 10. $-4 + 5x$ | 16. $-3x - 2$ | 22. $-24 - 30x$ | 28. $4x - 4y$ |
| 5. $-16 + 40x$ | 11. $12x + 36$ | 17. $16 - 24x$ | 23. $24 - 30x$ | 29. $-4c + 5$ |
| 6. $-7x - 28$ | 12. $10 + 15x$ | 18. $-6y + 12x$ | 24. $-24 + 30x$ | 30. $18x - 9$ |

EXERCISE 21e (p. 313)

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|---------------|---------------|----------------|----------------|----------------|
| 1. $25x + 12$ | 7. $x - 2$ | 13. $9x + 1$ | 19. $x - 21$ | 25. $15x - 9$ |
| 2. $27 - 6c$ | 8. $4f + 12$ | 14. $15 - 5x$ | 20. $31x - 11$ | 26. $11x + 7$ |
| 3. $14m - 20$ | 9. $4s - 3$ | 15. $12x + 8$ | 21. $14x + 11$ | 27. $-7 - 15x$ |
| 4. $3 - 6x$ | 10. $19x - 3$ | 16. $12x - 14$ | 22. $-6x - 19$ | 28. $2x + 21$ |
| 5. $6x - 4$ | 11. $17x - 1$ | 17. $4x - 12$ | 23. $14x - 19$ | 29. $2x + 15$ |
| 6. $13 - 8g$ | 12. $9x - 18$ | 18. $9x + 19$ | 24. $-6x + 11$ | 30. $5x - 2$ |

EXERCISE 21f (P. 314)

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

EXERCISE 21g (p. 315)

Should be used for discussion. Only the most able pupils should be allowed to work on their own.

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|--------|--------|--------|----------------|----------------|
| 1. 11 | 4. 12 | 7. 20p | 10. 80° | 12. 45° |
| 2. 6 | 5. 22p | 8. 4 | 11. 6 | 13. 4 |
| 3. 9cm | 6. 16 | 9. 18p | | |

The remainder of this chapter can be omitted. The work is repeated in later books.

EXERCISE 21h (p. 317)

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| 1. z^3 | 15. $12a$ | 29. $2a^2bc$ |
| 2. a^2 | 16. a^2b | 30. $24x^2y$ |
| 3. b^5 | 17. $15xz^2$ | 31. z^4 |
| 4. y^5 | 18. $5a^2b^2$ | 32. $6z^2$ |
| 5. s^3 | 19. $3 \times z \times z$ | 33. $24x^2$ |
| 6. z^6 | 20. $2 \times a \times b \times c$ | 34. $16x$ |
| 7. $a \times a \times a$ | 21. $4 \times z \times y \times y$ | 35. $4s^3$ |
| 8. $x \times x \times x \times x$ | 22. $6 \times a \times a \times b$ | 36. x^6 |
| 9. $b \times b$ | 23. $2 \times x \times x \times x$ | 37. y^2z^2 |
| 10. $a \times a \times a \times a \times a$ | 24. $3 \times a \times a \times a \times a \times b \times b$ | 38. $10xyz$ |
| 11. $x \times x \times x \times x \times x \times x$ | 25. $6xz$ | 39. a^7 |
| 12. $z \times z \times z \times z$ | 26. $6x^3$ | 40. $8x^4$ |
| 13. $2a$ | 27. $12a^2$ | 41. $axyz$ |
| 14. $4x^2$ | 28. $6a^3$ | 42. s^7 |

EXERCISE 21i (p. 318)

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|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------|
| 1. 2 | 8. $\frac{y^2}{24}$ | 15. $\frac{9}{7}$ or $1\frac{2}{7}$ | 21. $\frac{r^2}{24}$ | 27. $\frac{20}{3b}$ |
| 2. $\frac{22}{5}$ or $4\frac{2}{5}$ | 9. $\frac{c^2}{10}$ | 16. 2 | 22. $\frac{5z}{2}$ | 28. 1 |
| 3. $\frac{5}{8}$ | 10. 6 | 17. 4 | 23. $\frac{2}{3a}$ | 29. $\frac{ay}{4}$ |
| 4. $\frac{z^2}{6}$ | 11. $\frac{x^2}{4}$ | 18. $\frac{2}{5}$ | 24. 1 | 30. $\frac{y}{2x}$ |
| 5. $\frac{3ab}{10}$ | 12. 1 | 19. $\frac{3c}{2y}$ | 25. $\frac{x}{4}$ | 31. $\frac{4}{b}$ |
| 6. $\frac{4}{3}$ or $1\frac{1}{3}$ | 13. $\frac{2}{5}$ | 20. $\frac{3}{10z}$ | 26. $\frac{7}{4}$ or $1\frac{3}{4}$ | 32. $\frac{2x}{3y}$ |
| 7. 3 | 14. $\frac{7}{6}$ or $1\frac{1}{6}$ | | | |

EXERCISE 21j (p. 320)

1. $x = 5$ 3. 13 5. $4 \times a \times a$ 7. $2x - 1$ 8. $x = 0$
2. $4x - 11$ 4. $x = -4$ 6. $x = 1\frac{1}{3}$

EXERCISE 21k (p. 320)

1. $x = -\frac{1}{2}$ 3. 12 5. $x = 12$ 7. $5x + 6y$ 8. $x = 3$
2. $-2x + 15$ 4. $60abc$ 6. 1

EXERCISE 21l (p. 320)

1. $x = 2$ 3. $6 + x + 12 = 4x; x = 6$ 5. $4 - x$ 7. $6x + 4$ 8. $-2x + 10$
2. a^6 4. $x = -3$ 6. $\frac{4}{5}$

EXERCISE 21m (p. 321)

1. $x = -3$ 3. $x = 1$ 5. $x \times x \times x \times x \times x \times x$ 7. $5 - x$
2. $\frac{8}{5}$ or $1\frac{3}{5}$ 4. $x + x + 2 + 8 = 18; \text{£}4$ 6. $4x - 6$
8. We get $3 = 0$ which cannot be true (This problem can be used to discuss ∞ .)