

CHAPTER 12 Factors and Indices**EXERCISE 12a (p. 181)**

1. $1 \times 18, 2 \times 9, 3 \times 6$
2. $1 \times 20, 2 \times 10, 4 \times 5$
3. $1 \times 24, 2 \times 12, 3 \times 8, 4 \times 6$
4. $1 \times 27, 3 \times 9$
5. $1 \times 30, 2 \times 15, 3 \times 10, 5 \times 6$
6. $1 \times 36, 2 \times 18, 3 \times 12, 4 \times 9, 6 \times 6$
7. $1 \times 40, 2 \times 20, 4 \times 10, 5 \times 8$
8. $1 \times 45, 3 \times 15, 5 \times 9$
9. $1 \times 48, 2 \times 24, 3 \times 16, 4 \times 12, 6 \times 8$
10. $1 \times 60, 2 \times 30, 3 \times 20, 4 \times 15, 5 \times 12, 6 \times 10$
11. $1 \times 64, 2 \times 32, 4 \times 16, 8 \times 8$
12. $1 \times 72, 2 \times 36, 3 \times 24, 4 \times 18, 6 \times 12, 8 \times 9$
13. $1 \times 80, 2 \times 40, 4 \times 20, 5 \times 16, 8 \times 10$
14. $1 \times 96, 2 \times 48, 3 \times 32, 4 \times 24, 6 \times 16, 8 \times 12$
15. $1 \times 100, 2 \times 50, 4 \times 25, 5 \times 20, 10 \times 10$
16. $1 \times 108, 2 \times 54, 3 \times 36, 4 \times 27, 6 \times 18, 9 \times 12$
17. $1 \times 120, 2 \times 60, 3 \times 40, 4 \times 30, 5 \times 24, 6 \times 20, 8 \times 15, 10 \times 12$
18. $1 \times 135, 3 \times 45, 5 \times 27, 9 \times 15$
19. $1 \times 144, 2 \times 72, 3 \times 48, 4 \times 36, 6 \times 24, 8 \times 18, 9 \times 16, 12 \times 12$
20. $1 \times 160, 2 \times 80, 4 \times 40, 5 \times 32, 8 \times 20, 10 \times 16$

EXERCISE 12b (p. 181)

Some examples discussed with the class would be useful.

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| 1. 21, 24, 27, 30, 33, 36, 39 | 3. 28, 35, 42, 49, 56 | 5. 26, 39, 52, 65 |
| 2. 20, 25, 30, 35, 40, 45 | 4. 55, 66, 77, 88, 99 | |

EXERCISE 12c (p. 181)

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| 1. 2, 3, 5, 7, 11, 13 | 3. 31, 37, 41, 43, 47 | 5. 41, 101, 127 |
| 2. 23, 29 | 4. 5, 19, 29, 61 | 6. a) F b) F c) T d) T e) F |

EXERCISE 12d (p. 182)

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|----------|-----------|--------|-----------|-----------|
| 1. 2^3 | 7. 13^3 | 12. 27 | 17. 81 | 22. 3^3 |
| 2. 3^4 | 8. 19^2 | 13. 25 | 18. 16 | 23. 7^2 |
| 3. 5^4 | 9. 2^7 | 14. 8 | 19. 2^2 | 24. 5^2 |
| 4. 7^5 | 10. 6^4 | 15. 9 | 20. 3^2 | 25. 2^5 |
| 5. 2^5 | 11. 32 | 16. 49 | 21. 2^3 | 26. 2^6 |
| 6. 3^6 | | | | |

EXERCISE 12e (p. 183)

A calculator should be used for Nos. 11–16.

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|----------------------|--------------------------------|---------------------------------|---------|---------|
| 1. $2^2 \times 7^2$ | 5. $2^3 \times 3^2 \times 5^2$ | 8. $5^2 \times 13^3$ | 11. 108 | 14. 36 |
| 2. $3^3 \times 5^2$ | 6. $2^2 \times 3 \times 11^2$ | 9. $3^3 \times 5^2 \times 7^2$ | 12. 225 | 15. 180 |
| 3. $5^3 \times 13^2$ | 7. $3^2 \times 5 \times 7^4$ | 10. $2^2 \times 3^2 \times 5^2$ | 13. 112 | 16. 126 |

4. $2^2 \times 3^2 \times 5^2$

EXERCISE 12f (p. 184)

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|--------|--------|--------|--------|---------|
| 1. yes | 4. yes | 6. yes | 8. no | 10. yes |
| 2. no | 5. no | 7. yes | 9. yes | 11. yes |
| 3. yes | | | | |

EXERCISE 12g (p. 185)

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|-------------------|---------------------|----------------------------|-----------------------------|----------------------|
| 1. $2^3 \times 3$ | 3. $3^2 \times 7$ | 5. $2^3 \times 17$ | 7. $2^3 \times 3^3$ | 9. $3^4 \times 7^2$ |
| 2. $2^2 \times 7$ | 4. $2^3 \times 3^2$ | 6. $2^2 \times 3 \times 7$ | 8. $2^4 \times 3 \times 11$ | 10. $2^4 \times 7^2$ |

EXERCISE 12h (p. 185)

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|-------|-------|-------|-------|--------|
| 1. 3 | 4. 14 | 7. 21 | 9. 5 | 11. 15 |
| 2. 8 | 5. 25 | 8. 13 | 10. 4 | 12. 2 |
| 3. 12 | 6. 11 | | | |

EXERCISE 12i (p. 186)

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|-------|-------|-------|---------|---------|
| 1. 15 | 4. 36 | 7. 48 | 9. 36 | 11. 36 |
| 2. 24 | 5. 36 | 8. 60 | 10. 108 | 12. 168 |
| 3. 15 | 6. 60 | | | |

EXERCISE 12j (p. 186)

These problems are difficult and should be approached with caution. They are useful for discussion but only the most able children should be allowed to work through them on their own.

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| 1. £1 | 5. 2 minutes past midnight | 8. 30 steps; 2 |
| 2. £10.80 | 6. 78s | 9. 3 minutes |
| 3. 120m | 7. 13 turns and 6 turns | 10. 480, 20 |
| 4. 50cm | | |