

CHAPTER 18 Trigonometry

Exercises 18a to 18i repeat the work in Book 2A although there is a fuller introduction in Book 2A with work on drawing and measuring and on similar triangles.

Use of calculator: When two sides of a right-angled triangle are given, pupils can find an angle without a break to write down the value of the trig ratio. There are two reasons for discouraging this; firstly, many children cannot see their way through the complete calculation without the break; secondly, even if the calculation is done in one, the intermediate steps should be written down in case a mistake is made at the next stage. Some children make the jump from, for example, $\frac{x}{2} = \tan 20^\circ$ to the value of x . This should be strictly discouraged as examining boards expect an explicit expression for x before the calculation, i.e. $x = 2 \tan 20^\circ$. When the intermediate step is written down, it is not sensible to write down all the figures from the display; the first four significant figures will give answers correct to three significant figures.

Exercise 18a (p. 305)

7. $\frac{5}{12}$, 0.4167

9. $\frac{3}{4}$, 0.75

11. $\frac{12}{5}$, 2.4

8. $\frac{8}{15}$, 0.5333

10. $\frac{3}{4}$, 0.75

12. $\frac{35}{12}$, 2.917

Exercise 18b (p. 307)

1. 1.8807

7. 4.8716

13. 10.1°

19. 42.7°

2. 0.2493

8. 1

14. 19.6°

20. 38.7°

3. 0.5890

9. 0.5774

15. 55.0°

21. 17.8°

4. 0.3019

10. 1.1184

16. 23.4°

22. 69.6°

5. 0.0805

11. 0.0524

17. 53.7°

23. 42.7°

6. 3.0777

12. 0.5635

18. 32.3°

24. 0.1°

Exercise 18c (p. 308)

1. 32.0°

4. 35.8°

7. 31.0°

10. 47.7°

2. 63.4°

5. 51.3°

8. 51.3°

11. 34.2°

3. 23.2°

6. 60.9°

9. 48.4°

Exercise 18d (p. 309)

Some teachers may prefer to write $\tan 32^\circ = \frac{x}{4}$

1. 2.44cm

6. 81.8cm

11. 3.60cm

16. 10.4cm

2. 5.40cm

7. 5.62cm

12. 11.4cm

17. 4.69cm

3. 2.56cm

8. 22.2cm

13. 2.42cm

18. 366cm

4. 6.72cm

9. 2.82cm

14. 1.76cm

19. 0.976cm

5. 17.0cm

10. 7.54cm

15. 46.6cm

20. 69.5cm

Exercise 18e (p. 312)

1. 0.8862

3. 0.2470

5. 0.2622

7. 0.8625

9. 0.9903

2. 0.9397

4. 0.1564

6. 0.6088

8. 0.5

10. 0.4664

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|------------|-----------|-----------|-----------|
| 11. 0.2723 | 14. 26.2° | 17. 41.8° | 20. 46.7° |
| 12. 0.9988 | 15. 31.6° | 18. 21.8° | 21. 7.1° |
| 13. 15.7° | 16. 65.4° | 19. 37.9° | |

Exercise 18f (p. 313)

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|----------|----------|------------|------------|------------|
| 1. 30° | 5. 14.5° | 9. 23.6° | 13. 1.46cm | 17. 6.31cm |
| 2. 17.5° | 6. 62.7° | 10. 19.5° | 14. 4.57cm | 18. 21.9m |
| 3. 48.6° | 7. 44.4° | 11. 4.38cm | 15. 11.7cm | 19. 3.34cm |
| 4. 44.4° | 8. 41.8° | 12. 10.6cm | 16. 23.2cm | 20. 45.7cm |

Exercise 18g (p. 315)

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|-----------|-----------|-----------|-----------|-----------|
| 1. 0.8480 | 5. 0.5 | 9. 0.3040 | 13. 69.6° | 17. 89.2° |
| 2. 0.7455 | 6. 0.9632 | 10. 69.7° | 14. 51.1° | 18. 85.8° |
| 3. 0.1392 | 7. 0.6143 | 11. 20.6° | 15. 71.6° | |
| 4. 0.6717 | 8. 0.6561 | 12. 44.0° | 16. 30.1° | |

Exercise 18h (p. 316)

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|----------|------------|------------|
| 1. 34.9° | 8. 66.4° | 15. 11.6cm |
| 2. 36.9° | 9. 81.4° | 16. 38.2cm |
| 3. 45.6° | 10. 25.8° | 17. 2.90cm |
| 4. 48.2° | 11. 34.0° | 18. 17.1cm |
| 5. 48.2° | 12. 3.50cm | 19. 2.23cm |
| 6. 53.1° | 13. 26.9m | 20. 4.12cm |
| 7. 50.2° | 14. 1.96cm | 21. 13.5cm |

Exercise 18i (p. 319)

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|----------|-----------|------------|------------|
| 1. 40.0° | 10. 53.1° | 19. 6.69cm | 28. 3.08cm |
| 2. 33.6° | 11. 68.5° | 20. 19.3cm | 29. 113cm |
| 3. 51.3° | 12. 14.5° | 21. 8.03cm | 30. 2.59cm |
| 4. 42.8° | 13. 56.9° | 22. 4.86cm | 31. 9.99m |
| 5. 35.5° | 14. 37.8° | 23. 4.48cm | 32. 7.45cm |
| 6. 33.7° | 15. 39.3° | 24. 80.5cm | 33. 14.5cm |
| 7. 39.8° | 16. 55.6° | 25. 6.04cm | 34. 21.4cm |
| 8. 33.7° | 17. 42.1° | 26. 3.50cm | 35. 74.5cm |
| 9. 37.7° | 18. 66.2° | 27. 13.7cm | 36. 60.6cm |

Exercise 18j (p. 322)

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|-----------|-----------|-----------|-----------|------------|
| 1. 4.13cm | 3. 23.3cm | 5. 14.9cm | 7. 4.40cm | 9. 33.1cm |
| 2. 8.72cm | 4. 4.67cm | 6. 17.0cm | 8. 14.9cm | 10. 42.6cm |

Exercise 18k (p. 324)

Angles of elevation and depression will need revision. There are more problems using trigonometry in Chapters 19 and 20.

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|----------|----------|
| 1. 8.99m | 2. 47.7m |
|----------|----------|

3. 143m

4. 39.8°

5. 61.6°

6. 56.3°

7. 48.2°

8. 11.3°

9. a) 5.30cm b) 6.25cm

10. a) 5.20cm b) 15.6cm^2

11. 4.66m

12. a) $\angle AOB = 72^\circ$, $\angle OAB = 54^\circ$

b) 6.88cm

c) 34.4cm^2 , 172cm^2