Year 8 Circles, Area and Volume – Mixed Practice

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Answers and worked solutions · 30 questions

A. Mixed practice (mixed order)

1. **52 cm^2**

Area of a parallelogram = base × perpendicular height

13 × 4 = 52 cm^2

2. **210 cm^3**

Area of the triangle: ½ × 7 × 4 = 14 cm^2

Volume = area of cross-section × length = 14 × 15 = 210 cm^3

3. **21.98 cm**

C = πd

= 3.14 × 7 = 21.98 cm

4. **95 cm^2**

Base: 5 × 5 = 25 cm^2

Four triangles: 4 × ½ × 5 × 7 = 70 cm^2

Total: 95 cm^2

5. **192 cm^2**

Area of a parallelogram = base × perpendicular height

16 × 12 = 192 cm^2

6. **212.5 cm^3**

Area of the triangle: ½ × 5 × 5 = 12.5 cm^2

Volume = area of cross-section × length = 12.5 × 17 = 212.5 cm^3

7. **about 51.2 km**

32 × 1.6

= 51.2 km

8. **31.4 cm**

C = πd = 2πr

= 3.14 × 10 = 31.4 cm

9. **The formula is ½(a + b)h, so the area is half of that: 47.5 cm^2.**

Error: forgot to halve

Two copies of the trapezium make a parallelogram

½ × 95 = 47.5 cm^2

10. **169.56 cm**

C = πd = 2πr

= 3.14 × 54 = 169.56 cm

11. 800 cm^3

Area of the triangle: ½ × 10 × 10 = 50 cm^2

Volume = area of cross-section × length = 50 × 16 = 800 cm^3

12. 3.14; it is π (pi)

62.8 ÷ 20 = 3.14

For every circle, C ÷ d is the same number, π

13. 219.8 m

One turn: C = 3.14 × 70 = 219.8 cm

100 turns: 21980 cm = 219.8 m

14. a rectangle 4 cm by 3 cm

Divide each real length by 4

16 ÷ 4 = 4 cm and 12 ÷ 4 = 3 cm

15. Yes. C = πd, so 2d gives π × 2d = 2C.

Test an example

C = πd, so 2d gives π × 2d = 2C.

Decide

16. 90 cm^2

Area of a parallelogram = base × perpendicular height

15 × 6 = 90 cm^2

17. 12 edges

V − E + F = 2

7 − E + 7 = 2, so E = 12

18. 180 cm^2

Base: 6 × 6 = 36 cm^2

Four triangles: 4 × ½ × 6 × 12 = 144 cm^2

Total: 180 cm^2

19. about 22.4 km

14 × 1.6

= 22.4 km

20. 125.6 m

C = 2πr = 2 × 3.14 × 20

= 125.6 m

21. The formula is ½(a + b)h, so the area is half of that: 56 cm^2.

Error: forgot to halve

Two copies of the trapezium make a parallelogram

½ × 112 = 56 cm^2

22. 8 edges

V − E + F = 2
5 − E + 5 = 2, so E = 8

23. 12.56 cm

C = πd
= 3.14 × 4 = 12.56 cm

24. a rectangle 4 cm by 2 cm

Divide each real length by 4
16 ÷ 4 = 4 cm and 8 ÷ 4 = 2 cm

25. 39 m

C = πd, so d = C ÷ π
122.46 ÷ 3.14 = 39 m

26. Yes. 1 mile ≈ 1.6 km, so a mile is about 60% longer.

Test an example
1 mile ≈ 1.6 km, so a mile is about 60% longer.
Decide

27. 360 cm^2

Base: 10 × 10 = 100 cm^2
Four triangles: 4 × ½ × 10 × 13 = 260 cm^2
Total: 360 cm^2

28. 144 cm^3

Area of the triangle: ½ × 12 × 3 = 18 cm^2
Volume = area of cross-section × length = 18 × 8 = 144 cm^3

29. 68 cm^2

Area of a trapezium = ½(a + b)h
½ × (4 + 13) × 8 = 68 cm^2

30. about 84.8 km

53 × 1.6
= 84.8 km