Unit 10 · Area and Volume Cheat Sheet

Unit 10 focus: area of parallelograms, triangles, trapezoids and circles

1 AREA FORMULAS

Figure	Area
Parallelogram	A = bh
Triangle	$A = \frac{1}{2}bh$
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$
Circle	$A = \pi r^2$

2 PARALLELOGRAMS AND TRIANGLES

Use the perpendicular height.

Example: Triangle: base 14 m, height 9 m
Half of bh: $\frac{1}{2}(14)(9)$
Answer: 63 m²

3 TRAPEZOIDS

Average the bases times the height.

Example: Bases 8 and 12 ft, height 5 ft
Formula: $\frac{1}{2}(8 + 12)(5)$
Answer: 50 ft²

4 AREA OF A CIRCLE

Square the radius first. Use π ≈ 3.14 unless told otherwise.

Example: Diameter 10 in (use 3.14)
Radius: 5 in
Area: $3.14 \cdot 5^2$
Answer: 78.5 in²

5 SPACE FIGURES

Figure	Faces · edges · vertices
Cube	6 · 12 · 8
Triangular prism	5 · 9 · 6
Square pyramid	5 · 8 · 5

Check Euler: F + V − E = 2.

6 QUICK REMINDERS & COMMON MISTAKES

✔ Do remember

- Area: square units. Volume: cubic units.
- Radius is half the diameter.
- Square the radius before multiplying by π.

✘ Common mistakes

- Using d in πr^2: halve it first
- $(\pi r)^2$: only r is squared
- Slant height in prism volume: use the perpendicular height

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More practice: space figures, surface area and volume

1 SURFACE AREA

Solid	Surface area
Prism	sum of all faces (2B + Ph)
Cylinder	$2\pi r^2 + 2\pi rh$
Pyramid	$B + \frac{1}{2}P\ell$
Cone	$\pi r^2 + \pi r\ell$
Sphere	$4\pi r^2$

2 SURFACE AREA OF A CYLINDER

Two circles plus the curved rectangle.

Example: r = 3 cm, h = 10 cm (in terms of π)
Circles: $2\pi(9) = 18\pi$
Side: $2\pi(3)(10) = 60\pi$
Answer: 78π **cm²**

3 VOLUME

Solid	Volume
Prism, cylinder	V = Bh
Pyramid, cone	$V = \frac{1}{3}Bh$
Sphere	$V = \frac{4}{3}\pi r^3$

B is the area of the base.

4 VOLUME OF A CONE

One third of the matching cylinder.

Example: r = 6 in, h = 7 in (in terms of π)
Formula: $\frac{1}{3}\pi(36)(7)$
Answer: 84π **in³**

5 VOLUME OF A SPHERE

$V = \frac{4}{3}\pi r^3$

Example: r = 3 m (in terms of π)
Cube: 27
Multiply: $\frac{4}{3} \cdot 27 = 36$
Answer: 36π **m³**

6 CHECK YOURSELF

- Did I use the radius, not the diameter?
- Did I include every face for surface area?
- Did I use ⅓ for pyramids and cones?
- Are my units squared or cubed?