Formulas: algebra, geometry, fractions

PRAXIS MATH 5733 DUMP SHEET

Achievable

Arithmetic & number properties

- **Order of operations:** PEMDAS (Parentheses, Exponents, Multiply/ Divide, Add/Subtract)
- **Exponents:**
  - $a^m \cdot a^n = a^{m+n}$
  - $(a^m)^n = a^{mn}$
  - $\frac{a^m}{a^n} = a^{m-n}$
  - $a^{-n} = \frac{1}{a^n}$
- **Roots:** $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$

Fractions, decimals, percents

- **Percent:** $\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$
- **Percent change:** $\frac{\text{new} - \text{original}}{\text{original}} \times 100\%$

Algebra

- **Slope formula:** $m = \frac{y_2 - y_1}{x_2 - x_1}$
- **Slope—intercept form:** $y = mx + b$
- **Point—slope form:** $y - y_1 = m\,(x - x_1)$

Mechanics of materials

Triangles

- **Sum of interior angles:** 180°
- **Area:** $A = \frac{1}{2}\,bh$
- **Pythagorean theorem:** $a^2 + b^2 = c^2$

3D figures

- **Rectangular prism:** $V = lwh, \quad SA = 2(lw + lh + hw)$
- **Cube:** $V = s^3, \quad SA = 6s^2$
- **Cylinder:** $V = \pi r^2 h, \quad SA = 2\pi r^2 + 2\pi rh$
- **Cone:** $V = \frac{1}{3}\,\pi r^2 h, \quad SA = \pi r^2 + \pi r\ell$
- **Area:** $A = \frac{1}{2}\,bh$
- **Sphere:** $V = \frac{4}{3}\,\pi r^3, \quad SA = 4\pi r^2$

Quadrilaterals & polygons

- **Sum of interior angles of an n-gon :** $(n - 2) \cdot 180^\circ$
- **Rectangle:** $A = lw, \quad P = 2l + 2w$
- **Square:** $A = s^2, \quad P = 4s$
- **Parallelogram:** $A = bh$
- **Trapezoid:** $A = \frac{1}{2}\,(b_1 + b_2)h$

Circle:

- **Circumference:** $C = 2\pi r = \pi d$
- **Area:** $A = \pi r^2$
- **Arc length:** $\frac{\theta}{360^\circ} \cdot 2\pi r$
- **Sector area:** $\frac{\theta}{360^\circ} \cdot \pi r^2$