Grade 10 Math Cheat Sheet

Triangle congruence

Three sides or two with included angle	**SSS or SAS**
Two angles and one side	**ASA or AAS**
Right triangles: hypotenuse and leg	**HL**

Match corresponding vertices. AAA establishes similarity.

Scale and similarity

Length	**new = k × original**
Area	**new = k^2 × original**
Volume	**new = k^3 × original**

k is a positive scale factor. Match corresponding sides before finding the ratio.

Coordinate geometry

Slope	**$m = (y_2 - y_1) / (x_2 - x_1)$**
Midpoint	**$((x_1 + x_2)/2, (y_1 + y_2)/2)$**
Squared distance	**$d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$**

Take the nonnegative square root to get d. A vertical line has no defined slope.

Transform points

Reflect across the y-axis	**$(x, y) \to (-x, y)$**
Rotate 90° counterclockwise	**$(x, y) \to (-y, x)$**
Dilate by k > 0	**$(x, y) \to (kx, ky)$**

The rotation and dilation are centered at the origin. A dilation scales lengths by k.

Circle angles and arcs

Central angle and intercepted arc
angle measure = arc measure

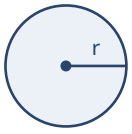
Inscribed angle	**angle measure = arc measure / 2**
Arc length, angle in radians	**$s = r\theta$**

Use the arc intercepted by the angle. Arc measure is an angle; arc length is a distance.

Circles

Circumference	**$C = 2\pi r = \pi d$**
Area	**$A = \pi r^2$**

The radius r runs from center to edge.
Diameter d = 2r.
Circumference uses length units; area uses square units.



Volume

Prism or cylinder	**$V = Bh$**
Pyramid or cone	**$V = Bh / 3$**
Sphere	**$V = (4/3)\pi r^3$**

B is the area of one base. h is perpendicular height.
Use cubic units.

Right triangle trigonometry

Sine	**sin(angle) = opposite / hypotenuse**
Cosine	**cos(angle) = adjacent / hypotenuse**
Tangent	**tan(angle) = opposite / adjacent**
Side lengths	**$a^2 + b^2 = c^2$**

Choose the acute angle before naming the legs. In the side rule, c is the hypotenuse.