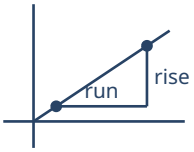
8th Grade STAAR Math Reference Sheet

Lines and slope

Slope-intercept	$y = mx + b$
Direct variation	$y = kx$
Slope	$m = (y_2 - y_1) / (x_2 - x_1)$

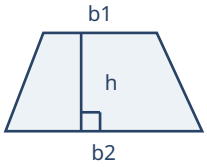
m is slope; b is the y-intercept.
k is the constant of proportionality.
Matching x-values give undefined slope.



Area of plane figures

Triangle	$A = \frac{1}{2}bh$
Rectangle or parallelogram	$A = bh$
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$

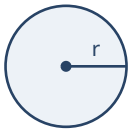
Measure h perpendicular to the base.
The trapezoid bases are parallel.
Use square units.



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.



Surface area

Right prism, lateral	$S = Ph$
Right prism, total	$S = Ph + 2B$
Right cylinder, lateral	$S = 2\pi rh$
Right cylinder, total	$S = 2\pi rh + 2\pi r^2$

P is base perimeter; B is base area.
Total adds both bases. Use square units.



Volume

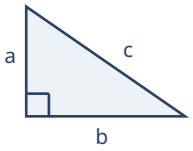
Prism or cylinder	$V = Bh$
Pyramid or cone	$V = Bh / 3$
Sphere	$V = (4/3)\pi r^3$

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

Right triangles

Pythagorean theorem	$a^2 + b^2 = c^2$

Legs a and b meet at a right angle.
Hypotenuse c is opposite that angle.



Simple and compound interest

Simple interest	$I = Prt$
Annual compounding	$A = P(1 + r)^t$

P is the starting amount, r is the annual rate as a decimal, and t is time in years.
I is only the interest. A is the total, including P.

Example: A cylinder's surface

Side only	$2\pi \times 3 \times 5 = 30\pi$ cm^2
Side and both ends	$30\pi + 2\pi \times 3^2 = 48\pi$ cm^2

The radius is 3 cm and the height is 5 cm.
Add both circular ends for total area.

