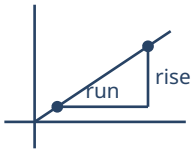
Grade 8 FAST Math Reference Sheet

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.



Graphing linear systems

First line	$y = 2x + 1$
Second line	$y = x + 4$
Intersection	$(3, 7)$

Graph both lines in slope-intercept form. The point where they cross satisfies both equations.
Distinct parallel lines never cross.

Angle sums and triangle sides

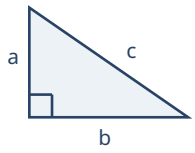
Right angle	$90°$
Angles on a straight line	$180°$
Triangle interior angles	$A + B + C = 180°$
Triangle sides	shortest + middle > longest

A, B and C are angle measures. With positive side lengths, checking the two shortest is enough.

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.



Powers and scientific notation

Same-base product	$a^m \times a^n = a^{m+n}$
Same-base quotient	$a^m / a^n = a^{m-n}$
Negative exponent	$a^{-n} = 1/a^n$
Scientific notation	$72{,}000 = 7.2 \times 10^4$

Here a is nonzero and m and n are integers.

Coordinate transformations

Translate	(x, y) becomes $(x + a, y + b)$
Reflect across x-axis	(x, y) becomes $(x, -y)$
Reflect across y-axis	(x, y) becomes $(-x, y)$
Dilate from origin	(x, y) becomes (kx, ky)

In the dilation, k is a positive scale factor.

Between measurement systems

Inches and centimeters	1 in = 2.54 cm
Feet and meters	1 ft = 0.3048 m
Miles and kilometers	1 mi = about 1.61 km
Pounds and kilograms	1 lb = about 0.454 kg

Multiply by a factor that cancels the unit you started with.

Basic probability

Equally likely outcomes	$P(A) = \text{favorable} / \text{total}$
Complement	$P(\text{not A}) = 1 - P(A)$
Example: fair die	$P(\text{even}) = 3/6 = ½$

The favorable count comes from the group named in the question.