Grade 7 FAST Math Reference Sheet

Ratios and unit rates

Unit rate	**rate = amount / quantity**
Example	**$12 ÷ 3 kg = $4 per kg**
Proportional relation	**y = kx**

Name the units and keep the ratios in the same order.
k is the rate per one unit of x.

Percent change and error

Change	**100% × (new − old) / old**
Error	**100% × |estimate − actual| / |actual|**
Example: 40 to 50	**100% × (10/40) = 25%**

Divide by the original value for change, or by the magnitude of the actual value for error. Neither denominator can be zero.

Simple interest

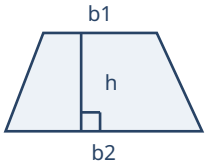
Interest earned	**I = Prt**
Ending balance	**A = P + I**
Example: $200, 3%, 2 yr	**I = 200 × 0.03 × 2 = $12**

P is starting money, r is the yearly rate as a decimal, and t is time in years.

Area of plane figures

Triangle	**A = ½bh**
Rectangle or parallelogram	**A = bh**
Trapezoid	**A = ½(b₁ + b₂)h**

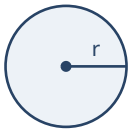
Measure h perpendicular to the base.
The trapezoid bases are parallel.
Use square units.



Circles

Circumference	**C = 2πr = πd**
Area	**A = πr²**

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



Right cylinder volume

Base area times height	**V = Bh = πr²h**
Example: r = 2, h = 5	**V = 20π units³**

r is the radius. h is the perpendicular height.



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) = favorable / total**
Complement	**P(not A) = 1 − P(A)**
Example: fair die	**P(even) = 3/6 = ½**

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