The Huge Giant Super Amazing Calculator Program!!!

Your Task: Work with a partner to create a super-giant amazing calculator! You will use *Git* to share code with each other and work on your functions separately!

Choose from the menu of functions below

Geometry Functions			
Function	**Input/Output**	**Formula**	**Points**
Area of a Triangle	In: b, h Out: Area	$A = \dfrac{1}{2} bh$	1
Area of a Trapezoid	In: b_1, b_2, h Out: Area	$A = \dfrac{1}{2} h(b_1 + b_2)$	1
Area of a Regular Polygon	In: *apothem, side length, number of sides* Out: Area	$A = n \left(\dfrac{1}{2} al \right)$	1
Circumference of a Circle	In: *radius* Out: Circumference	$C = 2\pi r$	1
Arc Length	In: *radius, angle of arc* Out: Arc Length	$L = 2\pi r \left(\dfrac{a}{360} \right)$	1
Area of a Circle	In: *radius* Out: Area	$A = \pi r^2$	1
Area of a Sector	In: *radius, angle of arc* Out: Area of Sector	$A = \pi r^2 \left(\dfrac{a}{360} \right)$	1
Volume of a Sphere	In: *radius* Out: Volume	$V = \dfrac{4}{3} \pi r^3$	1
Volume of a Cylinder	In: *radius, height* Out: Volume	$V = \pi r^2 h$	1
Volume of a Cone	In: *radius, height* Out: Volume	$V = \dfrac{1}{3} \pi r^2 h$	1
Pythagorean Theorem	In: *a, b* Out: *c*	$c = \sqrt{a^2 + b^2}$	1
Each of the above programs is worth an extra point if you call one of these functions *inside* another function **For example, if you see two functions that look similar, maybe there's a way to use one of the functions *inside* the other function**			

Unit Conversion Functions

Function	Input/Output	Formula	Points
Inches to Centimeters	In: Inches Out: Centimeters	$C = 2.54I$	1
Feet to Meters	In: Feet Out: Meters	$M = 0.305F$	1
Miles to Kilometers	In: Miles Out: Kilometers	$K = 1.609M$	1
Gallons to Liters	In: Gallons Out: Liters	$L = 3.78G$	1
Pounds to Kilograms	In: Pounds Out: Kilograms	$K = 0.45P$	1
Celsius to Fahrenheit	In: Celsius Out: Fahrenheit	$F = 1.8 \cdot C + 32$	1

Each of the above programs is worth an extra point if you also write a function for the *inverse* of the conversion.

In other words, you write a function that converts Celsius to Fahrenheit *and* Fahrenheit to Celsius.

Coordinate Functions

Function	Input/Output	Formula	Points
Slope Formula	In: $(x_1, y_1), (x_2, y_2)$ Out: Slope	$m = \dfrac{y_2 - y_1}{x_2 - x_1}$	2
Distance Formula	In: $(x_1, y_1), (x_2, y_2)$ Out: Distance	$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	2

Physics Functions

Function	Input/Output	Formula	Points
Velocity	In: *Initial velocity, acceleration, time* Out: *Velocity*	$v = v_0 + at$	1
Distance	In: *Initial distance, initial velocity, acceleration, time* Out: *Distance*	$d = d_0 + v_0 t + \frac{1}{2} at^2$	2
Circular Acceleration	In: *velocity, radius* Out: *Acceleration*	$a = \frac{v^2}{r}$	1
Momentum	In: *mass, velocity* Out: *momentum (p)*	$p = mv$	1
Kinetic Energy	In: *mass, velocity* Out: *Kinetic Energy*	$K = \frac{1}{2} mv^2$	1
Potential Energy	In: *mass, gravity, change in height* Out: *Potential Energy*	$P = mgy$	1
Current	In: *voltage, resistance* Out: *Current*	$I = \frac{V}{R}$	1
Power	In: *current, voltage* Out: Power	$P = IV$	1

Finance Functions

Function	Input/Output	Formula	Points
Simple Interest	In: *Principal, Rate (as decimal), Time* Out: Simple Interest Earned	$I = PRT$	2
Compound Interest	In: *Principal, Rate (as decimal), Time, number of times compounded per year* Out: Value after *t* years	$V = P \left(1 + \frac{r}{n} \right)^{nt}$	4