FORMULA SHEET

1. Derivatives

(1) $\dfrac{d\tan x}{dx} = \sec^2 x.$

(2) $\dfrac{d\cot x}{dx} = -\operatorname{cosec}^2 x.$

(3) $\dfrac{d\sec x}{dx} = \sec x \tan x.$

(4) $\dfrac{d\operatorname{cosec} x}{dx} = -\operatorname{cosec} x \cot x.$

(5) $\dfrac{d\arcsin x}{dx} = \dfrac{1}{\sqrt{1-x^2}}.$

(6) $\dfrac{d\arccos x}{dx} = \dfrac{-1}{\sqrt{1-x^2}}.$

(7) $\dfrac{d\arctan x}{dx} = \dfrac{1}{1+x^2}.$

2. Surface Areas and volumes

(1) Sphere of radius r:

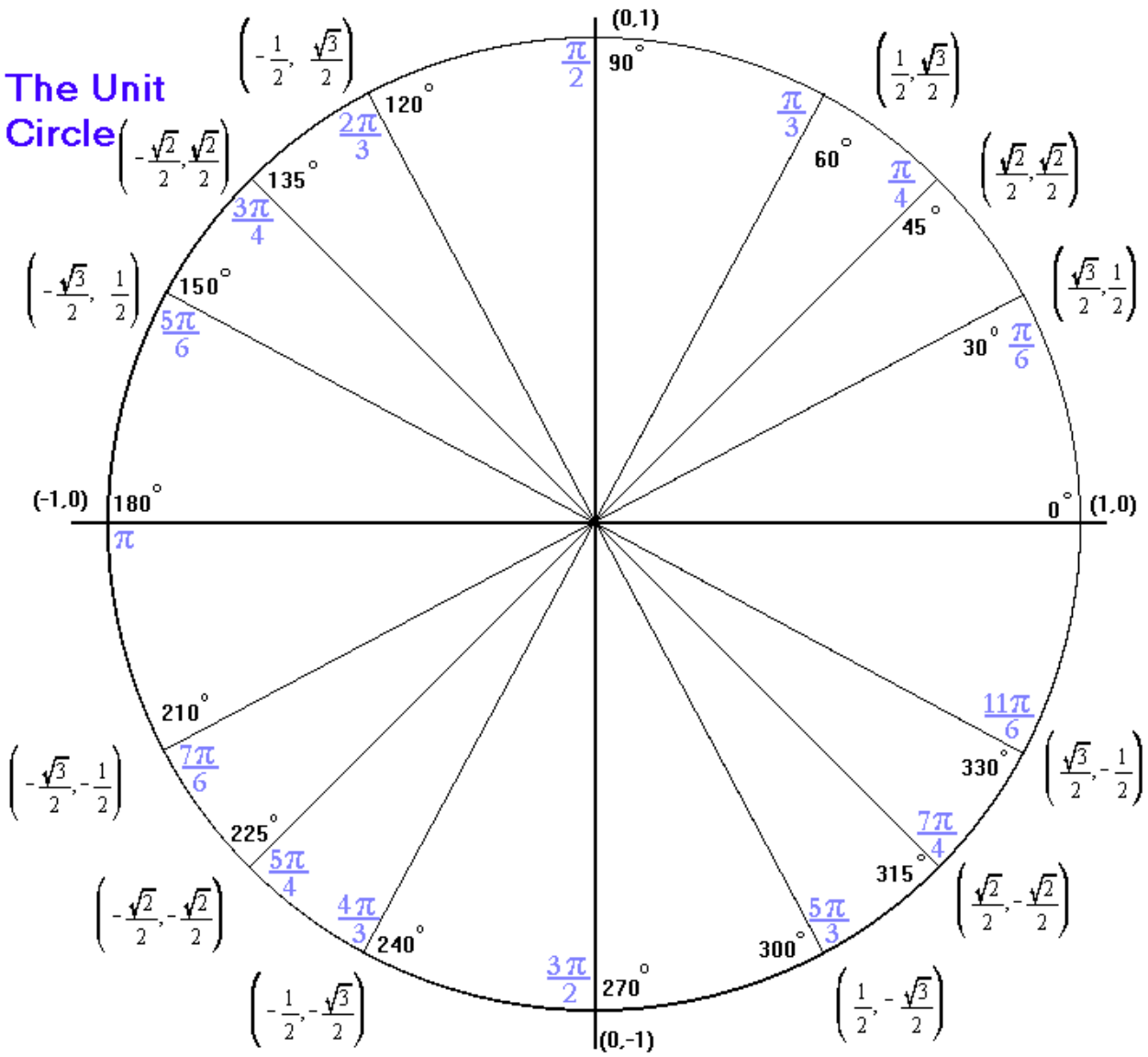
- Volume $= \dfrac{4}{3}\pi r^3$,
- Surface area $= 4\pi r^2$.

(2) Cylinder of radius r and height h:

- Volume $= \pi r^2 h$,
- Curved surface area $= 2\pi r h$,
- Total surface area $= 2\pi r h + 2\pi r^2$.

(3) Cone of radius r and height h:

- Volume $= \dfrac{1}{3}\pi r^2 h$,
- Curved surface area $= 2\pi r\sqrt{r^2+h^2}$,
- Total surface area $= 2\pi r\sqrt{r^2+h^2} + \pi r^2$.


The Unit Circle
(0,1)
90°
π/2
(1,0)
0°
(-1,0)
180°
π
(0,-1)
270°
3π/2
30°
π/6
45°
π/4
60°
π/3
120°
2π/3
135°
3π/4
150°
5π/6
210°
7π/6
225°
5π/4
240°
4π/3
300°
5π/3
315°
7π/4
330°
11π/6
(√3/2, 1/2)
(√2/2, √2/2)
(1/2, √3/2)
(-1/2, √3/2)
(-√2/2, √2/2)
(-√3/2, 1/2)
(-√3/2, -1/2)
(-√2/2, -√2/2)
(-1/2, -√3/2)
(1/2, -√3/2)
(√2/2, -√2/2)
(√3/2, -1/2)