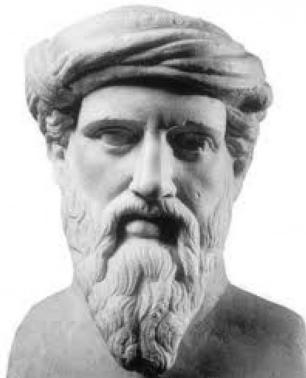


MATH CIRCLE TTU

Geometry

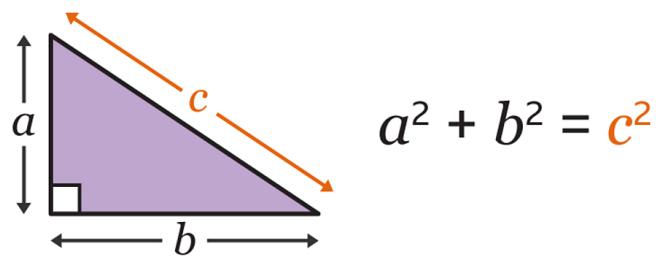
Trigonometry and Area



Trigonometric Functions

The trigonometric functions sine (sin) and cosine (cos) are defined as:

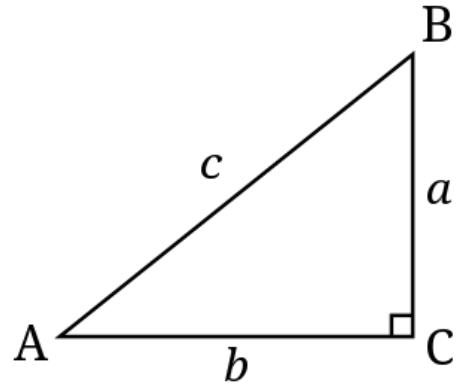
$$\sin(\alpha) = \frac{a}{c}, \quad \cos(\alpha) = \frac{b}{c}.$$



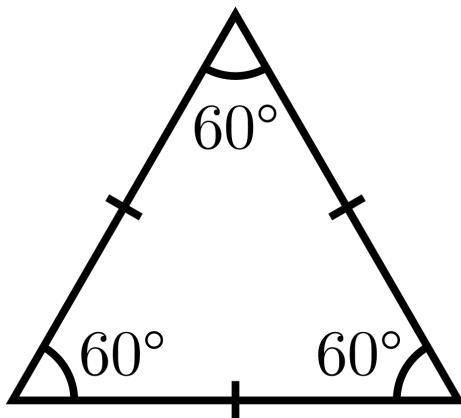
Question. In the figure, what angle is α ?

Computing Some Values

Sine and Cosine of $\alpha = 45^\circ$



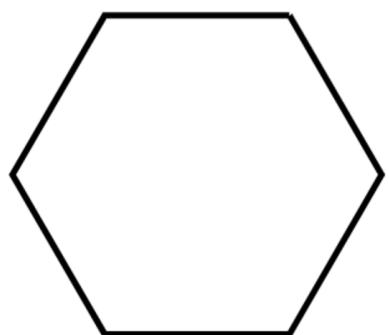
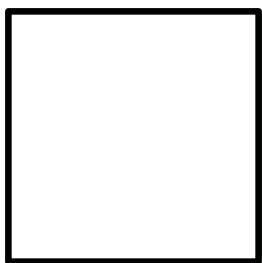
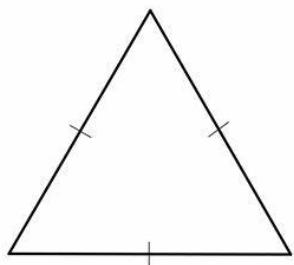
Sine and Cosine of $\alpha = 60^\circ$



Sine and Cosine of $\alpha = 30^\circ$

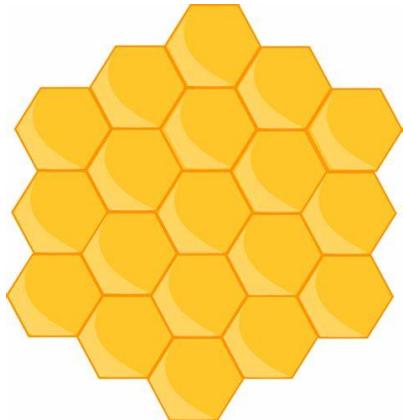
Area and Perimeter of Polygons

Problem. Compute the area and perimeter of the following regular polygons.



Question. With what regular polygons can we cover the floor?

What is the shape of a beehive?



Principle of Least Action. Everything in Nature happens using the minimum amount of energy/time/effort/money...