

First Trigonometric Identities...

Primary Trigonometric Ratios of Complementary Angles.

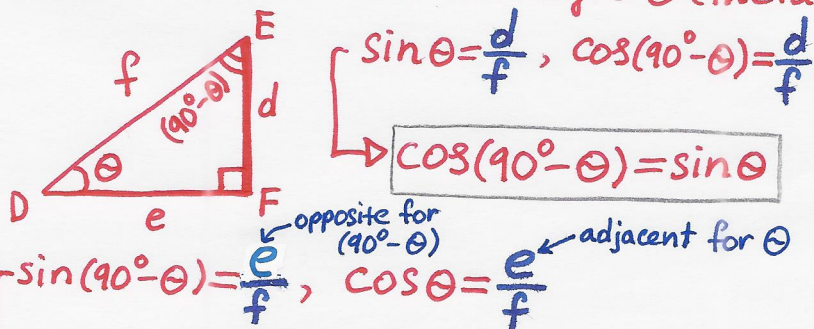
Remark: complimentary = expressing praise;
Complementary angles add up to 90 degrees:
in general, θ and $(90^\circ - \theta)$

Indeed, $\theta + (90^\circ - \theta) = 90^\circ$.

$$\sin(90^\circ - \theta) = \cos \theta, \quad \cos(90^\circ - \theta) = \sin \theta$$

$$\tan(90^\circ - \theta) = \frac{1}{\tan \theta}$$

Proof: Consider a right triangle
which houses an acute angle θ (theta)



$$\sin(90^\circ - \theta) = \cos \theta$$

$$\tan(90^\circ - \theta) = \frac{e}{d}, \quad \tan \theta = \frac{d}{e} = \frac{1}{\frac{e}{d}}$$

We can also notice that

$$\frac{e}{d} \cdot \frac{d}{e} = 1, \quad \frac{e}{d} \cdot \frac{d}{e} = 1$$

$$\tan(90^\circ - \theta) = \frac{1}{\tan \theta}$$

Therefore $\frac{e}{d}$ and $\frac{d}{e}$
are reciprocals of
each other.