

Name _____

Vector Formulas

Component Form: $\vec{v} = \langle x_2 - x_1, y_2 - y_1 \rangle$

Magnitude: $\|\vec{v}\| = \sqrt{x^2 + y^2}$

Direction (reference angle): $\theta' = \tan^{-1}\left(\frac{y}{x}\right)$

Unit Vector: $\vec{u} = \frac{\vec{v}}{\|\vec{v}\|}$

Dot Product: $\vec{a} \cdot \vec{b} = a_1 b_1 + a_2 b_2$

Angle Between Vectors: $\cos \theta = \frac{\vec{v} \cdot \vec{w}}{\|\vec{v}\| \|\vec{w}\|}$

Trig Form: $\vec{v} = \|\vec{v}\| \langle \cos \theta, \sin \theta \rangle$

Vector Applications:

1) Find resultant vector: $\vec{r} = \vec{a} + \vec{b}$

2) Find magnitude for resultant speed/distance.

