Name: _____

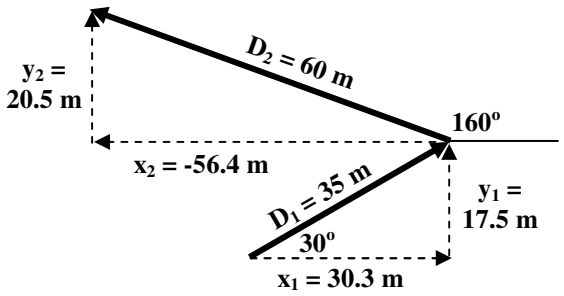
Period: _____

Additional Adding Vector Examples

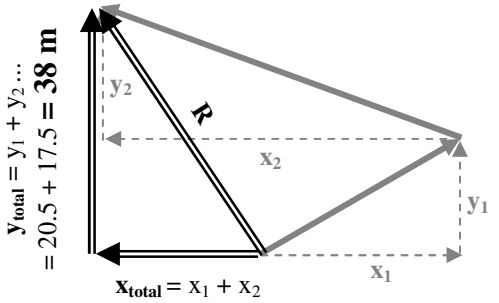
These additional examples are for students to visualize the process of adding vectors. It is assumed that students can already calculate components.

Ex. 1—Add these vectors: 35 m at 30° and 60 m at 160°.

***Step 1. Resolve** vectors into their **components**.*



Step 2. Calculate x_{total} and y_{total}



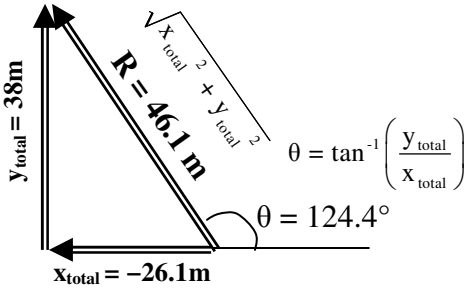
$= 30.3 - 56.4 = \mathbf{-26.1\ m}$

Step 3. Calculate R's magnitude and direction.

$R^2 = x_{total}^2 + y_{total}^2$

$R^2 = 26.1^2 + 38^2$

$R = 46.1$ m



$$\tan\theta = \frac{\text{opp.}}{\text{adj.}} = \frac{y_{total}}{x_{total}}$$

$$\tan\theta = \frac{38}{-26.1}$$

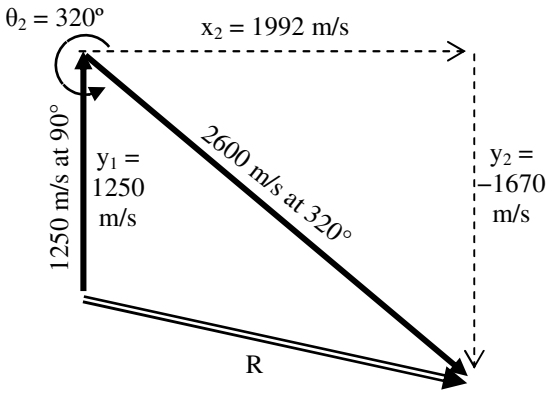
$$\theta = \tan^{-1}\left(\frac{38}{-26.1}\right) = -56.6°$$

$-56.6 + 180 = 124.4$

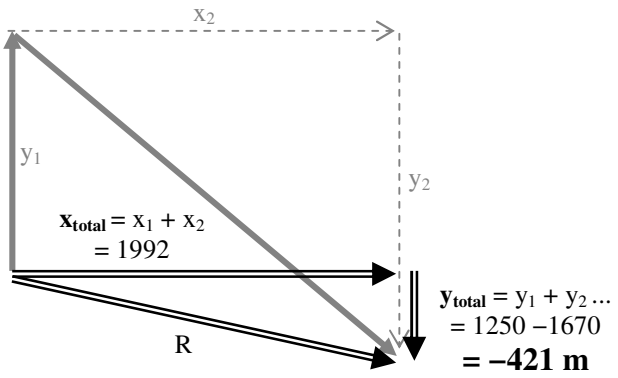
Add 180° to your angle because it is obviously not in the 4th quadrant.

Ex. 2—Add these vectors: 1250 m/s at 90° and 2600 m at 320°.

***Step 1. Resolve** vectors into their **components**.*



Step 2. Calculate x_{total} and y_{total}



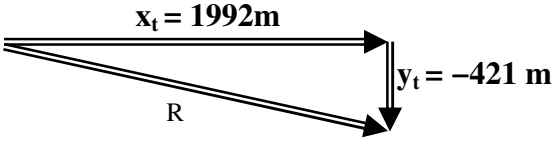
$y_{total} = y_1 + y_2 \ldots$
$= 1250 - 1670$
$= \mathbf{-421\ m}$

Step 3. Calculate R's magnitude and direction.

$R^2 = x_{total}^2 + y_{total}^2$

$R^2 = 1992^2 + 421^2$

$R = 2036$ m



$$\tan\theta = \frac{\text{opp.}}{\text{adj.}} = \frac{y_{total}}{x_{total}}$$

$$\tan\theta = \frac{-421}{1992}$$

$$\theta = \tan^{-1}\left(\frac{-421}{1992}\right) = -12°$$