48. We choose $+x$ east and $+y$ north and measure all angles in the "standard" way (positive ones are counterclockwise from $+x$). Thus, vector $\vec{d}_1$ has magnitude $d_1 = 4$ (with the unit meter and three significant figures assumed) and direction $\theta_1 = 225°$. Also, $\vec{d}_2$ has magnitude $d_2 = 5$ and direction $\theta_2 = 0°$, and vector $\vec{d}_3$ has magnitude $d_3 = 6$ and direction $\theta_3 = 60°$.

(a) The x-component of $\vec{d}_1$ is $d_1 \cos\theta_1 = -2.83$ m.

(b) The y-component of $\vec{d}_1$ is $d_1 \sin\theta_1 = -2.83$ m.

(c) The x-component of $\vec{d}_2$ is $d_2 \cos\theta_2 = 5.00$ m.

(d) The y-component of $\vec{d}_2$ is $d_2 \sin\theta_2 = 0$.

(e) The x-component of $\vec{d}_3$ is $d_3 \cos\theta_3 = 3.00$ m.

(f) The y-component of $\vec{d}_3$ is $d_3 \sin\theta_3 = 5.20$ m.

(g) The sum of x-components is $-2.83 + 5.00 + 3.00 = 5.17$ m.

(h) The sum of y-components is $-2.83 + 0 + 5.20 = 2.37$ m.

(i) The magnitude of the resultant displacement is $\sqrt{5.17^2 + 2.37^2} = 5.69$ m.

(j) And its angle is $\theta = \tan^{-1}(2.37/5.17) = 24.6°$ which (recalling our coordinate choices) means it points at about 25° north of east.

(k) and (ℓ) This new displacement (the direct line home) when vectorially added to the previous (net) displacement must give zero. Thus, the new displacement is the negative, or opposite, of the previous (net) displacement. That is, it has the same magnitude (5.69 m) but points in the opposite direction (25° south of west).