## 10-3 Reteach to Build Understanding

Vectors

1. Given vectors $\vec{s}=\langle 2,4\rangle$ and $\vec{t}=\langle 3,5\rangle$, complete the table to calculate the difference, directional difference, and magnitude.

|  | $\begin{aligned} & \vec{s}=\langle x, y\rangle \\ & \vec{t}=\langle x, y\rangle \end{aligned}$ | $\vec{s}-\vec{t}$ | Directional Difference | Magnitude |
| :---: | :---: | :---: | :---: | :---: |
| Algebra | $\begin{aligned} & \vec{s}=\left\langle x_{1}, y_{1}\right\rangle \\ & \vec{t}=\left\langle x_{2}, y_{2}\right\rangle \end{aligned}$ | $\left\langle x_{1}-x_{2}, y_{1}-y_{2}\right\rangle$ | $\theta=\tan ^{-1} \frac{\left(y_{1}-y_{2}\right)}{\left(x_{1}-x_{2}\right)}$ | $\sqrt{\left(x_{1}-x_{2}\right)^{2}+\left(y_{1}-y_{2}\right)^{2}}$ |
| Numbers | $\begin{aligned} & \vec{s}=\left\langle-^{\prime} \quad\right\rangle \\ & \vec{t}=\left\langle \_^{\prime} \quad\right\rangle \end{aligned}$ | $\begin{gathered} \langle 2-3,4-5\rangle \\ \left\langle-_{-},-\quad\right\rangle \end{gathered}$ | $\begin{aligned} \theta= & \tan ^{-1} \frac{(4-5)}{(2-3)} \\ = & \tan ^{-1} \frac{(-1)}{(-1)} \\ & \tan ^{-1} 1= \end{aligned}$ | $\begin{aligned} & \sqrt{(2-3)^{2}+(4-5)^{2}} \\ & \sqrt{(-1)^{2}+(-1)^{2}} \\ & \sqrt{1+1}=\sqrt{-} \end{aligned}$ |

2. Inés determined that the direction of $\vec{r}=\langle-2,4\rangle$ is approximately $27^{\circ}$. What errors did she make?

$$
\text { What is the direction of } \vec{r} \text { ? }
$$

$$
\begin{aligned}
& \theta=\tan ^{-1}\left(\frac{-2}{4}\right) \\
& \theta=\tan ^{-1}\left(\frac{1}{2}\right) \\
& \theta \approx 27^{\circ}
\end{aligned}
$$

3. Suppose $\vec{v}=\langle 4,-6\rangle$, and $\vec{v}$ is multiplied by a scalar of 4 . Write the component form, magnitude, and direction of the resultant vector.

Component Form:

$$
4 \cdot \vec{v}=4 \cdot\langle 4,-6\rangle=\left\langle \_\cdot 4,4 \cdot\left(-\_\right)\right\rangle=\left\langle \_,-\_\right\rangle
$$

Magnitude:

$$
\begin{equation*}
4|\vec{v}|=\ldots \sqrt{(4)^{2}+(-6)^{2}}=\ldots \sqrt{16+36}=4 \sqrt{\_} \approx \ldots(7.2) \approx \tag{7.2}
\end{equation*}
$$

$\qquad$
Direction:

$$
\begin{aligned}
& \theta=\tan ^{-1}\left(-\frac{24}{16}\right) \\
& \theta=\tan ^{-1}\left(-\frac{3}{}\right) \\
& \theta \approx
\end{aligned}
$$

