



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.

	$\vec{s} = \langle x, y \rangle$ $\vec{t} = \langle x, y \rangle$	$\vec{s} - \vec{t}$	Directional Difference	Magnitude
Algebra	$\vec{s} = \langle x_1, y_1 \rangle$ $\vec{t} = \langle x_2, y_2 \rangle$	$\langle x_1 - x_2, y_1 - y_2 \rangle$	$\theta = \tan^{-1} \frac{(y_1 - y_2)}{(x_1 - x_2)}$	$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
Numbers	$\vec{s} = \langle _, _ \rangle$ $\vec{t} = \langle _, _ \rangle$	$\langle 2 - 3, 4 - 5 \rangle$ $\langle _, _ \rangle$	$\theta = \tan^{-1} \frac{(4 - 5)}{(2 - 3)}$ $= \tan^{-1} \frac{(-1)}{(-1)}$ $\tan^{-1} 1 = _$	$\sqrt{(2 - 3)^2 + (4 - 5)^2}$ $\sqrt{(-1)^2 + (-1)^2}$ $\sqrt{1 + 1} = \sqrt{_}$

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

$$\theta = \tan^{-1} \left(\frac{-2}{4} \right)$$

$$\theta = \tan^{-1} \left(\frac{1}{2} \right)$$

$$\theta \approx 27^\circ$$

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:

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

Magnitude:

$$4|\vec{v}| = _ \sqrt{(4)^2 + (-6)^2} = _ \sqrt{16 + 36} = 4\sqrt{_} \approx _ (7.2) \approx _$$

Direction:

$$\theta = \tan^{-1} \left(-\frac{24}{16} \right)$$

$$\theta = \tan^{-1} \left(-\frac{3}{_} \right)$$

$$\theta \approx _$$