## Quiz 2

Name: $\qquad$ Score: $\qquad$

1. Which of the following functions $f$ are linear? Circle your answer.

If the function is linear, write the matrix $A$ such that $f(\vec{x})=A \vec{x}$.

- Let $\vec{p}=\left[\begin{array}{l}5 \\ 4\end{array}\right]$. Define $f: \mathbb{R}^{2} \rightarrow \mathbb{R}^{2}$ by $f(\vec{x})=\vec{x}+\vec{p}$.

> Linear

Not Linear

$$
A=[\square]
$$

- Define $f: \mathbb{R}^{2} \rightarrow \mathbb{R}^{2}$ by $f\left(\left[\begin{array}{l}a \\ b\end{array}\right]\right)=\left[\begin{array}{c}a-2 b \\ -3 a-b\end{array}\right]$.

$$
\text { Linear } \quad \text { Not Linear }
$$

$$
A=\left[\begin{array}{ll}
\square & \square
\end{array}\right]
$$

- Let $f: \mathbb{R}^{2} \rightarrow \mathbb{R}^{2}$ rotate each vector by $180^{\circ}$ counterclockwise.

$$
\text { Linear } \quad \text { Not Linear } \quad A=\left[\begin{array}{ll}
\square & \square
\end{array}\right]
$$

- Let $f: \mathbb{R}^{3} \rightarrow \mathbb{R}^{2}$ be defined by

$$
f\left(\left[\begin{array}{l}
a \\
b \\
c
\end{array}\right]\right)=\left[\begin{array}{c}
a b \\
a+b
\end{array}\right]
$$

Linear
Not Linear

$$
A=\left[\begin{array}{lll}
\square & \square & \square
\end{array}\right]
$$

2. Is the set of vectors

$$
\left\{\left[\begin{array}{c}
1 \\
3 \\
3 \\
-1
\end{array}\right] \quad\left[\begin{array}{c}
-1 \\
-6 \\
0 \\
0
\end{array}\right] \quad\left[\begin{array}{c}
0 \\
-5 \\
-2 \\
-8
\end{array}\right]\right\}
$$

linearly independent?

> Yes

No

