1. [10 points] Brianna is riding her unicycle on William Street. As she rides, she passes the Ann Arbor District Library. The function $u(t)$ represents Brianna's location (in meters west of the library) when she has been riding her unicycle for t seconds. The table below shows some values of $u'(t)$, the **derivative** of $u(t)$.

t	0	2	5	10	15	18	20	23	25	30
$u'(t)$	0	1	2	2.5	1.5	0	-1	-1.5	-2	-3

Note the following:

i) $u(23) = 2$.

ii) $u'(t)$ is continuous.

iii) $u'(t)$ satisfies:

- $u'(t)$ is increasing on $(0, 10)$.
- $u'(t)$ is decreasing on $(10, 30)$.

a. [2 points] Circle any of the following intervals on which $u(t)$ could be invertible.

$[3, 8]$ $[2, 15]$ $[5, 20]$ $[10, 25]$ NONE OF THESE

b. [3 points] $u(t)$ is invertible on the interval $[20, 30]$. Let $f(t)$ be the inverse of $u(t)$ on that interval. Calculate $f'(2)$ and include units.

Answer: _____

c. [2 points] Find the value of $\lim_{x \to 23} \dfrac{u(x) - u(23)}{x - 23}$. If the limit does not exist, write DNE. If it cannot be determined based on the information given, write NI.

Answer: _____

d. [1 point] Estimate the value of $u''(24)$.

Answer: _____

e. [2 points] Which of the following values of t could be inflection points of $u(t)$?

5 10 17 18 23 NONE OF THESE