Exercise 29

Explain, using Theorems 4, 5, 7, and 9, why the function is continuous at every number in its domain. State the domain.

$$A(t) = \arcsin(1 + 2t)$$

Solution

$\arcsin t$ and $1 + 2t$ are both continuous functions by Theorem 7, and the composition of these functions,

$$A(t) = \arcsin(1 + 2t),$$

is continuous by Theorem 9 in the arcsine function's domain.

$$-1 \le 1 + 2t \le 1$$

$$-2 \le 2t \le 0$$

$$\frac{-2}{2} \le t \le \frac{0}{2}$$

$$-1 \le t \le 0$$

Therefore, the domain of $A(t)$ is $[-1, 0]$.