1. For positive numbers $a < b$, the pulse function is defined as

$$P_{a,b}(x) = \begin{cases} 
0, & x < a \\
1, & a \leq x < b \\
0, & x \geq b 
\end{cases}$$

a. Sketch the graph of the pulse function.
b. Find $\lim_{x \to a^+} P_{a,b}(x)$
c. Find $\lim_{x \to a^-} P_{a,b}(x)$
d. Find $\lim_{x \to b^-} P_{a,b}(x)$
e. Find $\lim_{x \to b^+} P_{a,b}(x)$
f. Discuss the continuity of the pulse function.
g. Why is $U(x) = \frac{1}{b-a} P_{a,b}(x)$ called the unit pulse function.

2. Use the graph of $f(x) = x^2 + 3$ to find a number $\delta$ such that $|f(x) - 5.25| < 0.1$ whenever $|x - 1.5| < \delta$.
Interpret your answer on the graph below.