Math 181 Honors Quiz 2 Version B

1. Determine all intervals of numbers x satisfying the inequality $x < x^2$

2. State and prove the pythagorean theorem. State both the hypothesis and conclusion of the theorem as well as giving a proof written using complete sentences.

3. Write $x^2 + 6x + 4$ in the form $(x + h)^2 + k$ by completing the square.

4. The field axioms are

(1) $a + (b + c) = (a + b) + c$	(2) $a(bc) = (ab)c$
(3) $a + b = b + a$	(4) $ab = ba$
(5) $a(b + c) = ab + ac$	(6) $(a + b)c = ac + bc$
(7) $a + 0 = a$	(8) $a \cdot 1 = a$
(9) $a + (-a) = 0$	(10) $a \cdot \dfrac{1}{a} = 1$ if $a \neq 0$.

Use the axioms to prove that $a \cdot 0 = 0$. Carefully state which axiom is being used at each step of your argument.