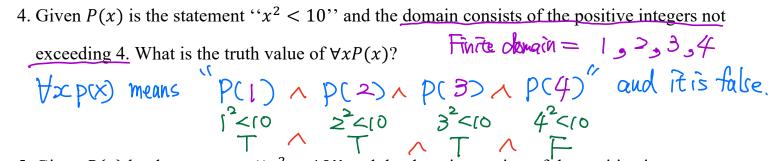
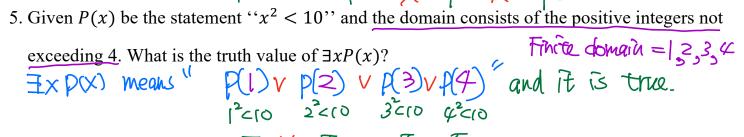
MAT2440, Classwork9, Spring2025

ID:	Name:
1. Quantifier with Restric	ted Domain:
Given the following sta	tements of quantifier with restricted domain:
(a) $\forall x < 0 (x^2 > 0)$	(b) $\forall y \neq 0 (y^3 \neq 0)$ (c) $\exists z > 0 (z^2 = 2)$
(a) $\forall x < o(x^2 > o)$ made (a) $\forall x < o(x^2 > o)$ made (a) $\forall y \neq o (y^3 \neq o)$ in and (a) (a) (b) $\forall y \neq o (y^3 \neq o)$ in and (a) (b) (b) (c)	mean where the domain in each case consists of the real numbers? Ans "for every real number," with $x < 0$, $x^2 > 0$ " For every negative real number x , $x^2 > 0$ " There exists a positive real number x , $x^2 > 0$ " There exists a positive real number x such that $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ such that $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ such that $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ such that $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ is $x > 0$. There exists a positive real number $x > 0$ is $x > 0$.
	example (a) & cb) Italian quantification is the same as existential quantification example (cc)
3. Quantifier over Finite I	Domain:
When the domain of a d	quantifier is finite (that is, when all its elements can be listed),
quantifier statement car	be expressed using propositional logic:
	domain be $x_1, x_2, x_3, \dots, x_n$, then
$\forall x P(x)$ is the same as	b(d) V b(se) V b(se) V ···· V b(xe)
$\exists x P(x)$ is the same as	P(X) V P(XE) V P(XE) V ···· V P(XE)





- 6. Given a proposition: "Every student in your class has taken a course in calculus." $\forall x P(x)$
 - (a) Using the universal quantification to express this proposition.
 - (b) Write down the negation of this proposition.
 - (c) Using the quantification to express the negation of this proposition.

(c) Using the quantification to express the negation of this proposition.

(a)
$$x : Student in your class, p(x): x has taken a course in calculus$$

- 7. Given a proposition: "There is at least a student in your class who takes calculus."
 - (a) Using the existential quantification to express this proposition.
 - (b) Write down the negation of this proposition.
 - (c) Using the quantification to express the negation of this proposition.