Math 265
YOUR NAME
February 3, 2026

Homework # 5

Due: Wednesday 02/11/2026

See *Help* section at the end

Problem 1: Using symbolic logic, write the logical structure of the sentence below.

For every real number x, if $x > 1$, then $x^2 > x$.

Answer: YOUR ANSWER GOES HERE.

Problem 2: For each problem below, write the English words using symbols in LaTeX.

(a) The set A is a subset of the set B.
Answer: YOUR ANSWER GOES HERE.

(b) x is not an element of the set B.
Answer: YOUR ANSWER GOES HERE.

Problem 3: Let $A = \{a, b, c, d\}$ and $B = \{a, b\}$.

(a) Find $A \cap B$. (Your answer is a *set*, thus it must be in curly brackets: { and }.
Answer: YOUR ANSWER GOES HERE.

(a) Find $\mathcal{P}(B)$, the power set of B.
Answer: YOUR ANSWER GOES HERE.

Problem 4: Write the Pythagorean Theorem as a *displayed* equation. (This means you will write it using *double* dollar signs.)
Answer: YOUR ANSWER GOES HERE.

Problem 5: Simplify the expression $\frac{x^3-2x}{5x-5\sqrt{2}}$ as you would for a student learning Algebra. So you will use a string of *aligned equations with justifications*. The basic structure is provided.
Answer: YOUR ANSWER GOES IN THE ALIGNED EQUATIONS BELOW.

$$\begin{aligned} \frac{x^3-2x}{5x-5\sqrt{2}} &= \frac{x(x^2-2)}{5(x-\sqrt{2})} && \text{factor out common terms} \\ &= XXXX && \text{YYYY} \\ &= XXXX && \text{YYYY} \end{aligned}$$

Help Section
Either delete this section or comment it out (with %) when you submit your final draft

Table of LaTeXSymbols

words	what you type into LaTeX	what appears in the PDF	example
is an element of	\in	$\in$	$x \in \mathbb{R}$
is not an element of	\not \in	$\notin$	$x \notin \mathbb{R}$
is a subset of	\subseteq	$\subseteq$	$\mathbb{Q} \in \mathbb{R}$
curly brackets	\{ or \}	{ or }	
power set	\mathcal{ P }(A)	$\mathcal{P}(A)$	
intersection	\cap	$\cap$	
union	\cup	$\cup$	
implies	\Rightarrow	$\Rightarrow$	$P \Rightarrow Q$
for all	\forall	$\forall$	$\forall x \in \mathbb{R}$
there exists	\exists	$\exists$	
logical and	\land	$\land$	
logical or	\lor	$\lor$	
logical negation	\sim	$\sim$	
subscript	A_2	A_2	
superscript	x^2	x^2	
dollar sign	\$	\$	
number sign	\#	#	
ampersand	\&	&	
new line	\cr or \\		
backslash	\textbackslash	\	
square root of 2	\sqrt{2}	$\sqrt{2}$	
fraction	\frac{A}{b}	$\frac{A}{b}$	
real numbers	\mathbb{R}	$\mathbb{R}$	
emptyset	\emptyset	$\emptyset$	