M17_LE1_001

Mathematics 17 — College Algebra and Trigonometry
First Long Examination — First Semester AY 2012-2013

I. Write TRUE if the statement is always true, otherwise, write FALSE.

1. For any number z, $z^0 = 1$.
2. If $a \in \mathbb{R}$, m, $n \in \mathbb{N}$ and $a^m = a^n$, then $m = n$.
3. If A, $B \subseteq X$ and $A \subseteq B$, then $X \setminus B \subseteq X \setminus A$.
4. For any $x, y, z \in \mathbb{R}$, $\dfrac{x}{y} + \dfrac{x}{z} = \dfrac{x}{y+z}$.
5. The equation $x + (y+z) = (y+z) + x$ is true because of the associative axiom for addition.
6. For $A \subset B$ with $n(A) = p$ and $n(B) = q$, we have $n(A \times B) < pq$.

II. Fill in the blanks.

1. If $A = \{x \in \mathbb{R} : |x| \leq 6\}$ and $B = \{x \in \mathbb{R} : |x| \leq 1\}$ then $B - A =$ _____.
2. The quotient when $x^4 - 3$ is divided by $x^2 + 4x - 5$ is _____.
3. In completely factored form, $4n^2 - 6n - 4nm + 6m =$ _____.
4. The factors of $81a^8 + 4a^4b^8$ are _____.
5. In simplified form, $\dfrac{3}{\sqrt[3]{-54}} + \sqrt[6]{16} =$ _____.
6. The imaginary part of $\left(\dfrac{\bar{1}}{3-4i}\right)$ is _____.

III. Do as indicated.

1. Simplify: $\left(\dfrac{m-1}{2m^2-3m-2} - \dfrac{m}{m^2-4}\right) \div \dfrac{m^2+2}{2m^3+5m^2+2m}$.

2. Simplify: $\dfrac{1-\dfrac{1-x}{1-\dfrac{1+x}{1-x}}}{\dfrac{1}{x+1}-1}$.

3. Simplify: $\dfrac{1}{a}\sqrt[3]{27a^4b^2}+b\sqrt[3]{\dfrac{-8a}{b}}$.

4. Express the following in rectangular form: $\dfrac{(5+i^{-7})(3-i^{99})}{(5-i^{-3})(3+i^{11})}$.

END OF EXAM