Math 001.12 Quiz # 1 Sem. I , Oct 1 , 2005

Name :_____ **ID. # :** _____ **SER. # :** ____

Complete the following, show your work and simplify your answer:

- If $\mathrm{A} = \{x | x \text{ is an odd positive integer}, \ 4 \leq x \leq 16\}$ and $\mathrm{B} = \{x | x \text{ is a prime number } < 12\}$, then $\mathrm{A} \cap \mathrm{B} = \cdots\cdots\cdots$

Ans : $\mathrm{A} = \{5 \ , \ 7 \ , \ 9 \ , \ 11 \ , \ 13 \ , \ 15\}$; $\mathrm{B} = \{2 \ , \ 3 \ , \ 5 \ , \ 7 \ , \ 11\}$; $\mathrm{A} \cap \mathrm{B} = \{5 \ , \ 7 \ , \ 11\}$

- The coefficient of x^2 in the product $(2x^2 + 3x - 1)(3x^2 - 5x + 2)$ is $\cdots\cdots\cdots$

Ans : The coefficient of $x^2 = 2(2) - 1(3) + 3(-5) = -14$

- The multiplicative inverse of -0.04 is $\cdots\cdots\cdots$

Ans : The multiplicative inverse of -0.04 is $\frac{1}{-0.04} = -\frac{1}{\frac{4}{100}} = -\frac{100}{4} = -25$

- If $1 < x < 2$, then $\left| \frac{x-2}{|x| - |x-1|} \right| = \cdots\cdots\cdots$

Ans : $= \left| \frac{x-2}{x-(x-1)} \right| = \left| \frac{x-2}{x-x+1} \right| = |x-2| = -(x-2) = 2 - x$

- When rationalized, the expression $\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}} = \cdots\cdots\cdots$

Ans : $= \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}} \cdot \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{(\sqrt{3} - \sqrt{2})^2}{3 - 2} = 3 - 2\sqrt{3}\sqrt{2} + 2 = 5 - 2\sqrt{6}$

Math 001.18 **Quiz # 1** **Sem. I , Oct 1 , 2005**

Name :_____ **ID. # :** _____ **SER. # :** ____

Complete the following, show your work and simplify your answer:

- $A = \{x | x$ is an even positive integer , $6 \leq x < 20\}$ and
  $B = \{x | x$ is a composite number $\leq 17\}$, then find $A \cap B = \cdots\cdots\cdots$

Ans : $A = \{6\ ,\ 8\ ,\ 10\ ,\ 12\ ,\ 14\ ,\ 16\ ,\ 18\}$; $B = \{4\ ,\ 6\ ,\ 8\ ,\ 9\ ,\ 10\ ,\ 12\ ,\ 14\ ,\ 15\ ,\ 16\}$;

$A \cap B = \{6\ ,\ 8\ ,\ 10\ ,\ 12\ ,\ 14\ ,\ 16\}$

- $-2 < x < 1$, then $\left| \dfrac{x+2}{|x-1| + |x+4|} \right| = \cdots\cdots\cdots$

Ans : $= \left| \dfrac{x+2}{1 - x + x + 4} \right| = \left| \dfrac{x+2}{5} \right| = \dfrac{x+2}{5}$

- In the product $(3 - 2x)(2x^2 - 5x + 1)(3 + 2x)$ the leading coefficient is $\cdots\cdots$ and the degree is $\cdots\cdots$

Ans : $= (9 - 4x^2)(2x^2 - 5x + 1)$, so the leading coefficient $= (-4)(2) = -8$ and the degree $= 4$

- In the set $= \{-\dfrac{8\sqrt{27}}{\sqrt{12}}\ ,\ \dfrac{4}{0}\ ,\ \dfrac{\pi}{\pi + 2}\ ,\ -41.123456789\ ,\ 0.232332333\ldots\ldots\}$

  the rational number(s) is (are) $\cdots\cdots\cdots\cdots$

Ans : $-\dfrac{8\sqrt{27}}{\sqrt{12}} = -\dfrac{8(3)\sqrt{3}}{2\sqrt{3}} = -12$ and -41.123456789 (terminating decimal)

are the rational numbers.

- When rationalized, the expression $\dfrac{\sqrt[5]{2}}{\sqrt[5]{9xy^3}} = \cdots\cdots\cdots$

Ans : $= \dfrac{\sqrt[5]{2}}{\sqrt[5]{3^2 xy^3}} \cdot \dfrac{\sqrt[5]{3^3 x^4 y^2}}{\sqrt[5]{3^3 x^4 y^2}} = \dfrac{\sqrt[5]{54 x^4 y^2}}{3xy}$

Math 001.30 Quiz # 1 Sem. I , Oct 1 , 2005

Name :_____ **ID. # :** _____ **SER. # :** ____

Complete the following, show your work and simplify your answer:

- In the set $\{8.112233\ldots\ ,\ \frac{\sqrt{9}}{\sqrt{21}}\ ,\ \frac{\pi^2}{\pi^2+1}\ ,\ -\sqrt{-16}\ ,\ 14.235235235\ldots\ ,\ \frac{7}{22}\}$,

  the **irrational** number(s) is (are) $\cdots\cdots\cdots$

Ans : $\frac{\sqrt{9}}{\sqrt{21}} = \frac{3}{\sqrt{21}}$, $\frac{\pi^2}{\pi^2+1}$, $8.112233\ldots$ (non-terminating, non-repeating decimal)

are the irrational numbers.

- If $-2 < x < 0$, then $|-x-2| + |x-1| - \frac{|x|}{x} = \cdots\cdots\cdots$

Ans : $= -(-x-2) - (x-1) - \left(\frac{-x}{x}\right) = x+2-x+1+1 = 4$

- If $P(x)$ and $Q(x)$ are two polynomials both of degree 6, then the degree of $P(x) - Q(x)$ is $\cdots\cdots$ and the degree of $P(x) \cdot Q(x)$ is $\cdots\cdots$

Ans : The degree of $P(x) - Q(x) \leq 6$ and the degree of $P(x) \cdot Q(x) = (6)(6) = 12$

- $(3-2x)^3 - 2(2-3x)(2+3x) = \cdots\cdots\cdots$

Ans : $= 27 - 3(9)(2x) + 3(3)(4x^2) - 8x^3 - 2(4-9x^2) = 27 - 54x + 36x^2 - 8x^3 - 8 + 18x^2$

$= -8x^3 + 54x^2 - 54x + 19$

- When rationalized, the expression $\frac{\sqrt{x}}{\sqrt[3]{x^2}} = \cdots\cdots\cdots$

Ans : $= \frac{\sqrt{x}}{\sqrt[3]{x^2}} \cdot \frac{\sqrt[3]{x}}{\sqrt[3]{x}} = \frac{x^{\frac{1}{2}}\, x^{\frac{1}{3}}}{x} = \frac{x^{\frac{5}{6}}}{x} = \frac{\sqrt[6]{x^5}}{x}$