$(x^3-4x)^3-4(x^3-4x)$

$f(x)=x^3-4x$

$f\circ f=f(f(x))=(f(x))^3-4f(x)$

$=(x^3-4x)^3-4(x^3-4x)$

م 3-12:32 ناضم

$g(x)=\frac{1}{x^2+1}$

$g\circ g$

$\frac{1}{(g(x))^2+1}=\frac{1}{\left(\frac{1}{x^2+1}\right)^2+1}$

م 3-12:49 ناضم

$f(x)=x^3-4x,\ g(x)=\frac{1}{x^2+1},\ h(x)=x^4$

$f\circ g\circ h$

$f(g(h(x)))$:

$g(h(x))=\frac{1}{(x^4)^2+1}$

$f(g(h(x)))=\left(\frac{1}{(x^4)^2+1}\right)^3-4\left(\frac{1}{(x^4)^2+1}\right)$

م 3-12:57 ناضم

$f\circ h\circ g$

$f(x)=x^3-4x,\ g(x)=1/x^2+1,\ h(x)=x^4$

$f(h\circ g)$

$h(g(x))=$

$h(g(x))=(g(x))^4=\left(\frac{1}{x^2+1}\right)^4$

$f(h(g(x)))=\left(\left(\frac{1}{x^2+1}\right)^4\right)^3-4\left(\frac{1}{x^2+1}\right)^4$

م 3-01:12 ناضم

$p\rightarrow q$

Contrapositive:

$\neg q\rightarrow \neg p$

1) If you don't get F you will take an examination

م 3-01:22 ناضم

Exo 3

Every integer greater than 1 has a unique prime factorization

$\forall x\in\mathbb{Z}\cdot x>1\rightarrow x$ unique...

م 3-01:30 ناضم

converse:
$p \to q$
$q \to p$ [converse]
$\forall x: p \to q$
$\forall x: q \to p$ [converse]
$\forall x \in \mathbb{Z}: x$ has unique.. $\to$
every integer $x > 1$ that has unique..
x is greather than one

م 3-01:33 ناضم

p
$\neg p$ (Inverse)
$\forall x: p$
$\forall x: \neg p$ (Inverse)
$a \to b \equiv \neg a \vee b$
:

م 3-01:36 ناضم

$\forall x \in \mathbb{Z}: \neg(\underbrace{x>1}_{q} \to \underbrace{x \text{ is prime}}_{b})$
$a \to b \equiv a \vee \neg b$
$\neg(a \to b) \equiv \neg a \wedge b$
$\forall x \in \mathbb{Z}: x \leq 1$ and x is prime..

م 3-01:39 ناضم

$\forall x: p \to q$
$\forall x: \neg q \to \neg p$ [contrapositive]
$\forall x \in \mathbb{Z}: x$ is not prime $\to$
$x \leq 1$.

م 3-01:42 ناضم

p
$\neg p$ (Inverse negation)
$\forall x: p$
$\forall x: \neg p$ (Invers)
$\neg(\forall x: p)$ (Negation: $\exists x: \neg p$
$\neg(\exists x: p) \equiv \forall x: \neg p$.
$\exists x \in \mathbb{Z}, \neg(x>1 \to x \text{ is prime}..)$

م 3-01:44 ناضم

$(p \to q) \vee (q \to p)$
($p \to q$ = a; $q \to p$ = b)

p	q	$p \to q$	$q \to p$	$a \vee b$
F	F	T	T	T
F	T	T	F	T
T	F	F	T	T
T	T	T	T	T

م 3-01:51 ناضم

$(P \vee \neg q) \rightarrow (q \wedge \neg p)$

p	q	¬p	¬q	p ∨ ¬q	q ∧ ¬p	Result
F	F	T	T	T	F	F
F	T	T	F	F	T	F
T	F	F	T	T	F	F
T	T	F	F	T	F	F

م 3-01:56 ناضمر

$A = \{d, i, s, c, r, e, t\}$, $B = \{r, e, t\}$

$A \times B = \{(d, r), (d, e), (d, t), \ldots\}$

Find the power set of B

$B = \{\emptyset, \{r\}, \{e\}, \{t\}, \{r, e\}, \{r, t\}, \{e, t\}, \{r, e, t\}\}$

م 3-02:04 ناضمر

$(A \cup B)^c \stackrel{?}{=} A^c \cap B^c$

So

$= \{d, i, s, c, r, e, t\}^c$

$= \{a, h, m\}$

م 3-02:09 ناضمر

$A = \{a, e, h, m, r, t\}$

$B = \{a, c, d, l, m, s, h\}$

$A^c \cap B^c = \{a, m, h\}$

م 3-02:13 ناضمر