Q1: Given the hypotheses:

* I work hard or I am smart
* I am not smart
* If I work hard then I will pass the exam
* If I am lucky then I will pass the exam

Which statement can be deduced from the above hypotheses?

Select one:

a. I work hard and I am lucky

b. I work hard and I pass the exam

c. None of the other choices is correct

d. I work hard and I pass the exam and I am lucky

Q2: Which propositions are contradiction? (done)

|  |  |
| --- | --- |
| [p\to q)\wedge(q\to p)\wedge(p\oplus q)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=(p\to%20q)\wedge(q\to%20p)\wedge(p\oplus%20q)) | Yes/ No |
| [(p\to q)\vee(q\to p)]\wedge(p\oplus q)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=%5b(p\to%20q)\vee(q\to%20p)%5d\wedge(p\oplus%20q)) | Yes/ No |
| [p\to q)\vee(q\to p)\vee(p\oplus q)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=(p\to%20q)\vee(q\to%20p)\vee(p\oplus%20q)) | Yes/ No |

Q3: Which pairs of propositions are logically equivalent?

|  |  |
| --- | --- |
| [forall xP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\forall%20xP(x,y))và [forall yP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\forall%20yP(x,y)) | Answer 1Choose...NoYes |
| [exists yP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20yP(x,y)) và [exists xP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20xP(x,y)) | Answer 2Choose...NoYes |
| [forall x\forall yP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\forall%20x\forall%20yP(x,y)) và [forall y\forall xP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\forall%20y\forall%20xP(x,y)) | Answer 3Choose...NoYes |
| [forall x\exists yP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\forall%20x\exists%20yP(x,y))và [exists x\forall yP(x,y)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20x\forall%20yP(x,y)) | Answer 4Choose...NoYes |

Q4: Let A, B be sets. The statement

[ \cup (B \cap \overline{A}) = A \cup B](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=A%20\cup%20(B%20\cap%20\overline%7bA%7d)%20=%20A%20\cup%20B)

is True of False?

Select one:

True

False

Q5: Find the cardinality of the set { a, { a }, { a, { a } } }. 3

Q6: Compute

[lfloor \left( \frac{7}{2}\right)^2 \rfloor - \left( \lfloor \frac{7}{2} \rfloor \right)^2](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\lfloor%20\left(%20\frac%7b7%7d%7b2%7d\right)%5e2%20\rfloor%20-%20\left(%20\lfloor%20\frac%7b7%7d%7b2%7d%20\rfloor%20\right)%5e2)= 3

Q7: Compute 

[lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4}\rceil \rfloor](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\lfloor%20\frac%7b3%7d%7b2%7d%20-%20\lceil%203%20+%20\frac%7b5%7d%7b4%7d\rceil%20\rfloor) = -4

Q8: Let f: Z x Z --> Z, f(m, n) = m+2 . Choose correct answer:

Select one:

a. f(x) is neither one-to-one nor onto

b. f is one-to-one but not onto

c. f is onto but not one-to-one

d. f is a bijection

Q9: Compute

[displaystyle \sum_{j=0}^3\sum_{i=0}^2 (i+j)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\displaystyle%20\sum_%7bj=0%7d%5e3\sum_%7bi=0%7d%5e2%20(i+j))

Select one:

a. 24

b. 18

c. Lựa chọn khác

d. 20

e. 30

Q11: Which propositions are logically equivalent to [[\leftrightarrow q](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=p\leftrightarrow%20q)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=p%5Cleftrightarrow%20q" \o "TeX)?

|  |  |
| --- | --- |
| [neg q\leftrightarrow \neg p](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\neg%20q\leftrightarrow%20\neg%20p) | No/Yes |
| [neg p\leftrightarrow q](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\neg%20p\leftrightarrow%20q) | No/Yes |
| [\leftrightarrow\neg q](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=p\leftrightarrow\neg%20q) | No/Yes |
| [neg p\leftrightarrow \neg q](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\neg%20p\leftrightarrow%20\neg%20q) | No/Yes |

Q12: Let  
  
P(x) = "x goes to class regularly"  
  
Q(x) = "x reads books"  
  
R(x) = "x passed the exam"  
  
Translate the sentence into logical expression, domain is the set of all students in class.  
  
"Some student who goes to class regularly and reads books has failed the exam"

Select one:

1. [exists x((P(x)\vee Q(x))\to \neg R(x))](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20x((P(x)\vee%20Q(x))\to%20\neg%20R(x)))
2. None of the other choices is correct
3. [exists x(P(x)\wedge Q(x)\wedge \neg R(x))](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20x(P(x)\wedge%20Q(x)\wedge%20\neg%20R(x)))
4. [exists x(P(x)\vee Q(x)\vee \neg R(x))](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20x(P(x)\vee%20Q(x)\vee%20\neg%20R(x)))
5. [exists x((P(x)\wedge Q(x)) \to neg R(x))](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\exists%20x((P(x)\wedge%20Q(x))%20\to%20neg%20R(x)))

Q13: Let A ={1, 2, 4, 6, 7, 9, 8} B = {3, 1, 5, 7, 6}. Which set has the maximum cardinality?

Select one:

a. [-A](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=B-A)

b. [ \cap B](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=A%20\cap%20B)

c. [-B](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=A-B)

### Q14: Compute

### [displaystyle\sum_{j=0}^3\sum_{i=1}^2 (i+2j)](https://cmshn.fpt.edu.vn/filter/tex/displaytex.php?texexp=\displaystyle\sum_%7bj=0%7d%5e3\sum_%7bi=1%7d%5e2%20(i+2j))

Select one:

a. 24

b. 38

c. 40

d. 36

e. Lựa chọn khác