QUIZ 3

CIS1910

QUIZ 3

Let x, y and z be real numbers.
Consider the four statements below:

(i) $1/x = y$ iff $x = 1/y$
(ii) $\sqrt{x} = y$ iff $x = y^2$
(iii) $|x| = |y|$ iff $x = y$
(iv) $xz = yz$ iff $x = y$

How many of these statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

Consider the four statements below:

(i) $13 = 3x2^2 + 0x2^1 + 1x2^0$
(ii) $13 = (301)_2$
(iii) $13 = 1x3^2 + 1x3^1 + 1x3^0$
(iv) $13 = (111)_3$

How many of these statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

Consider two positive integers m and n.

(i) Knowing the base 3 expansion of m,
it is "easy" to calculate its base 6 expansion
(i.e., no need to calculate its base 10 expansion)

(ii) Knowing the base 3 expansion of m,
it is easy to calculate its base 9 expansion

(iii) Knowing the base 3 expansions of m and n,
it is easy to calculate the base 3 expansion of m+n

(iv) Knowing the base 3 expansions of m and n,
it is easy to calculate the base 3 expansion of mn

How many of the four statements above are correct?

A. 0 **B.** 1 **C.** 2 **D.** 3 **E.** 4

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QUIZ 3

Consider the addition + of real numbers.

(i) It is idempotent.
(ii) It is commutative.
(iii) It is associative.
(iv) There is a neutral element for it.
(v) There is an absorbing element for it.

How many of these five statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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Consider the multiplication x of real numbers.

(i) It is idempotent.
(ii) It is commutative.
(iii) It is associative.
(iv) There is a neutral element for it.
(v) There is an absorbing element for it.

How many of these five statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

Consider the subtraction $-$ of real numbers.

(i) It is idempotent.
(ii) It is commutative.
(iii) It is associative.
(iv) There is a neutral element for it.
(v) There is an absorbing element for it.

How many of these five statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

Consider *min* (as in "minimum").
It is a binary operation on the set of real numbers.

(i) It is idempotent.
(ii) It is commutative.
(iii) It is associative.
(iv) There is a neutral element for it.
(v) There is an absorbing element for it.

How many of these five statements are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

(i) + is distributive over x
(ii) x is distributive over +
(iii) *min* is distributive over *max*
(iv) *max* is distributive over *min*

How many of the four statements above are correct?

A. 0
B. 1
C. 2
D. 3
E. 4

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QUIZ 3

Let ★ and ❖ be two binary operations on a set S.
★ is **distributive** over ❖ iff for any (u,v,w) in S^3 we have:

(i) u★(v❖w)=(u★v)❖(u★w)
(ii) u❖(v★w)=(u❖v)★(u❖w)
(iii) u★(v❖w)=(u★v)❖(u★w) and u❖(v★w)=(u❖v)★(u❖w)

How many of the three statements above are correct?

A. 0
B. 1
C. 2
D. 3

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QUIZ 3

Let ★ be a binary operation on a set S.
An element u of S is a **neutral element** for ★ iff:

(i) for any element v of S we have u★v=u
(ii) for any element v of S we have u★v=v
(iii) for any element v of S we have u★v=0

How many of the three statements above are correct?

A. 0
B. 1
C. 2
D. 3

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QUIZ 3

Let ★ be a binary operation on a set S.

(i) There may be no neutral element for ★
(ii) There may be one and exactly one neutral element for ★
(iii) There may be two and exactly two neutral elements for ★

How many of the three statements above are correct?

A. 0
B. 1
C. 2
D. 3

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QUIZ 3

Let S be a set (not necessarily a set of real numbers),
let − be a unary operation on S,
and let + and x be two binary operations on S.
For any elements u, v and w of S, we have:

(i) (u+v)+w = u+(v+w)
(ii) (u+v)xw ≠ u+(vxw)
(iii) −(u+v) = (−u)+(−v)

How many of the three statements above are correct?

A. 0
B. 1
C. 2
D. 3