Ans-10.pdf

SP-DSE-MATH-EP(M2) 10(c)

1991-AL-P MATH 1 #01

1992-AL-P MATH 1 #03

1.

2.

and

3.

1993-AL-P MATH 1 #06(a)

1993-AL-P MATH 1 #06(b)

Also

1994-AL-P MATH 1 #01

Then,

1995-AL-P MATH 1 #01(a)

Let be the statement that for all positive integers n

For n = 1,
L.H.S =

R.H.S =
L.H.S = R.H.S.
is true

Assume that is true for some integer , then

is true
Therefore, is true by mathematical induction.

1995-AL-P MATH 1 #01(b)

Let , and

Then and

1996-AL-P MATH 1 #01

Hence,

1997-AL-P MATH 1 #07(a)

is non-singular
Also,

A is 3x3

1997-AL-P MATH 1 #07(b)

Therefore, is a root of

Also,

Therefore, roots of are and

Now,

Therefore, A is non-singular and

Hence,

is NOT a solution because

or or

or or

1999-AL-P MATH 1 #09(a)

Let P(n) be the statement that for any positive integer n

When n = 1,

L.H.S. =

R.H.S. =
L.H.S. = R.H.S.
Therefore P(1) is true.

Assume P(k) is true for some integer k 1, then,

Therefore, P(k+1) is true.

By mathematical induction, P(n) is true

1999-AL-P MATH 1 #09(b)

Note that :
and

if and
and

aq+bs=0 and ap=0 and ar=0
aq+bs=0 and p=0 and r=0 ()

On the other hand, if aq+bs=0 and p=0 and r=0,

and

1999-AL-P MATH 1 #09(c)

Let a = x , , p = r = 0 , and s = z so that
and

Now let

and

and

and (by 9(b))

1999-AL-P MATH 1 #09(d)

Let x=2, y=5, z=1, and also let

so that C = D + E and DE=ED=0

(by 9(a))

2000-AL-P MATH 1 #01

Let P(n) be the statement that for all positive integers n.

When n = 1,

Therefore P(1) is true.

Assume that is true for some positive integer . Then

Therefore P(k+1) is true. By mathematical induction, P(n) is true for positive integers n.

2002-AL-P MATH 1 #12(a)(i)

and
and
There exist such that
exists

2002-AL-P MATH 1 #12(a)(ii)

2002-AL-P MATH 1 #12(a)(iii)

are commutative i.e.

2002-AL-P MATH 1 #12(a)(iv)

Let , then

2002-AL-P MATH 1 #12(b)(i)

Therefore,

(by (a)(i))

2002-AL-P MATH 1 #12(b)(ii)

- For where k is an positive integer
- For where k is an positive integer
- For where k is an positive integer
- For where k is an positive integer

2002-AL-P MATH 1 #12(b)(iii)

Let , then

Also, let , then

2003-AL-P MATH 1 #08(a)

or

2003-AL-P MATH 1 #08(b)

Now and

Also,

Since

Therefore,

- For n = 2k where k is a positive integer,

- For n = 2k-1 where k is a positive integer,

2003-AL-P MATH 1 #08(c)

2004-AL-P MATH 1 #08(a)

Let

Therefore,

2004-AL-P MATH 1 #08(b)

Let P(n) be the statement that for all positive integers n.

When n = 1,

Therefore, P(1) is true.

Assume that P(k) is true for some positive integer k . Then, Therefore, P(k+1) is true. By mathematical induction P(n) is true.

2004-AL-P MATH 1 #08(c)

Let , ,

2004-AL-P MATH 1 #08(d)

Let . Then

Also

Hence

2007-AL-P MATH 1 #05(a)

and
and

2007-AL-P MATH 1 #05(b)

Now,

is 2x2)

2011-AL-P MATH 1 #08(a)(i)

and
Also, a, b are either both positive or both negative
(both positive) or (both negative)

or

is non-singular.

2011-AL-P MATH 1 #08(a)(ii)

2011-AL-P MATH 1 #08(a)(iii)

and

2011-AL-P MATH 1 #08(b)

Let a=4, b=1, then

Also, let

so that

where and for any positive integer k

Consider
Let and , then

SP-DSE-MATH-EP(M2) #10(a)

Let P(n) be the statement that

for all positive integers n.

When n = 1,

Therefore, P(1) is true.

Assume P(k) is true for some positive integer , then

Therefore, P(k+1) is true. By mathematical induction P(n) is true.

SP-DSE-MATH-EP(M2) #10(b)

or
or

SP-DSE-MATH-EP(M2) #10(c)

and
and (or)
or
or
or