

Started on	Friday, 19 November 2021, 5:00 PM
State	Finished
Completed on	Friday, 19 November 2021, 5:20 PM
Time taken	19 mins 9 secs
Marks	5.00/5.00
Grade	10.00 out of 10.00 (100%)

Question **1**

Correct

Mark 1.00 out of 1.00

Which of the following is a subspace of

$$\mathbb{R}^3$$

☒ a. All vectors of the form

$$(a, b, a - 2b)^t$$



where a and b are real numbers.

☐ b. All vectors of the form

$$(0, a, a^2)^t$$

where a is a real number.

☐ c. All vectors of the form

$$(a, b, 2)^t$$

where a and b are real numbers.

☐ d. All vectors of the form

$$(a + 2, a, 0)^t$$

where a is a real number.

Your answer is correct.

The correct answer is:

All vectors of the form

$$(a, b, a - 2b)^t$$

where a and b are real numbers.

Question **2**

Correct

Mark 1.00 out of 1.00

Suppose

$$T : \mathbb{R}^4 \longrightarrow \mathbb{R}^4$$

is a linear transformation such that

$$T(T(v)) = v$$

for all vectors v . Then the dimension of $\ker(T)$ equals

- ☐ a. Cannot be determined
- ☒ b. 0
- ☐ c. 1
- ☐ d. 2



Your answer is correct.

The correct answer is:

0

Question **3**

Correct

Mark 1.00 out of 1.00

Let V be the vector space of 5×5 matrices

$$(a_{ij})$$

with real entries such that

$$a_{ij} = a_{rs}$$

whenever $i+j=r+s$ where

$$1 \leq i, j, r, s \leq 5$$

. Then the dimension of V over the real numbers equals

- ☒ a. 9
- ☐ b. 18
- ☐ c. 25
- ☐ d. 11



Your answer is correct.

The correct answer is:

9



Question **4**

Correct

Mark 1.00 out of 1.00

Let

$$T : \mathbb{R}^2 \longrightarrow \mathbb{R}^2$$

be a 1-1 linear transformation such that

$$T \circ T = T$$

. Then $T(v)=v$ for every vector v .

Select one:

☒ True ✓

☐ False

The correct answer is 'True'.

Question **5**

Correct

Mark 1.00 out of 1.00

Let A be a 4×3 matrix with real entries. Then there exists at least one vector

$$B \in \mathbb{R}^4$$

such that the system $AX=B$ has no solutions.

Select one:

☒ True ✓

☐ False

The correct answer is 'True'.

◀ Recording of discussion on 19 November 2021

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