Question 1

Every linearly independent set of five vectors in $\mathbb{R}^5$ is a basis for $\mathbb{R}^5$.

Select one:

○ False

◉ True ✔

The correct answer is: True

Question 2

The set $\{(1,1,1)^T,(1,1,\alpha)^T,(1,\alpha,1)^T\}$ is linearly dependent in $\mathbb{R}^3$ if

Select one:

○ $\alpha = 1$

○ $\alpha = -1$

○ $\alpha \neq 1$

◉ α is any real number. ✗

The correct answer is: $\alpha = 1$

Question 3

Correct

Marked out of 1.50

⚑ Flag question

Any basis of $\mathbb{R}^{2\times 4}$ must contain exactly six vectors.

Select one:

○ True

◉ False ✔

The correct answer is: False

Question 4

Incorrect

Marked out of 1.50

⚑ Flag question

The vectors $1, x, x^2, x^2 + x - 1$ are linearly dependent in P_3.

Select one:

◉ False ✖

○ True

The correct answer is: True

Question **5**

Incorrect

Marked out of
1.50

⚑ Flag
question

$$\dim\left(\operatorname{span}\left(1+x, 1+x+x^2, 2+2x+x^2, x^2\right)\right) =$$

Select one:

- ○ 4
- ○ 2
- ○ 3
- ◉ 1 ✗

The correct answer is: **2**

Question **6**

Correct

Marked out of
1.50

⚑ Flag
question

The **Wronskian** of x, e^x, e^{-x} is equal to

Select one:

- ◉ $2x$ ✔
- ○ -2
- ○ 2
- ○ $2x - 1$

Incorrect

Marked out of
1.50

⚑ Flag
question

If $f_1, f_2, \ldots, f_n \in C^{n-1}([a, b])$ and $W(f_1, f_2, \ldots, f_n)(x) \neq 0$ for some $x \in [a, b]$, then $f_1, f_2, \ldots, f_n$ are linearly independent.

Select one:

○ True

◉ False ✗

The correct answer is: True

Question 8

Correct

Marked out of
1.50

⚑ Flag
question

let $S = \{p \in P_3 : p'(0) = 0\}$. One of the following is a basis for S.

Select one:

○ $\{x^2, 2x - 1\}$

○ $\{x^2 - 2x, 1\}$

○ $\{x, x^2\}$

◉ $\{1, x^2\}$ ✔

Question 9

Incorrect

Marked out of 1.50

⚑ Flag question

If the set $\{v_1, v_2, \ldots, v_k\}$ is linearly independent in P_4 then $k = 4$.

Select one:

○ False

◉ True ✗

The correct answer is: False

Question 10

Incorrect

Marked out of 1.50

⚑ Flag question

If two vectors are linearly independent, then each of them is a scalar multiple of the other.

Select one:

○ False

◉ True ✗

The correct answer is: False