Question 6

Which of the following is a subspace of $F(-\infty,\infty)$

- ○ $W=\{f \in F(-\infty,\infty): f(x) \leq 0\}$
- ◉ $W=\{f \in F(-\infty,\infty): f(0) = 0\}$
- ○ $W=\{f \in F(-\infty,\infty): f \text{ is a polynomial of degree } n\}$
- ○ $W=\{f \in F(-\infty,\infty): f(x) \geq 0\}$

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Question 5

If V is the vector space of real valued functions defined on $\mathbb{R}^+$ *with* $f(x) > 0$ *for all* x, *with the operations:*

$(f+g)(x) = f(x)g(x)$, $\quad (kf)(x) = [f(x)]^k$.

Then the negative (additive inverse) $-f$ *of the function* $f(x) = e^x$ *is:*

Hint: [*the additive identity (zero vector) is the constant function* $1(x) = 1$].

- ○ $-f(x) = -e^{-x}$
- ○ $-f(x) = -e^{x}$
- ◉ $-f(x) = e^{-x}$
- ○ $-f(x) = e^{x}$

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Question 3

If $u = (-3,2,1)$ *and* $v = (2,1,0)$ *then the vector* $3u + v$ *equals*

- ○ $(7,7,3)$
- ● $(-7,7,3)$
- ○ $(2,6,4)$
- ○ $(-4,6,3)$

⚠ Moving to the next question prevents changes to this answer.

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Question 4

The angle θ between $u = (2,1,-3)$ and $v = (2,-1,1)$ satisfies

- ○ $\cos(\theta) = -1$
- ● $\cos(\theta) = 0$
- ○ $\cos(\theta) = 1$
- ○ $\cos(\theta) = \frac{\sqrt{2}}{2}$

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Question 8

If $a \geq 0$ *and* $\|u\|^2 = 18$, *then the value of a and b that makes* $u = (a,2,-1,3)$ *and* $v = (b,1,-1,2)$ *orthogonal are*

- $a = -2, b = -11$
- $a = 2, b = \frac{3}{2}$
- $a = 4, b = \frac{6}{4}$
- $a = 2, b = \frac{-9}{2}$

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Question 7

If $\|u\| = \|v\|$ *and* $\|u+v\|^2 + (u-2v)\cdot(v) = 3$*, then* $u \cdot v$ *equals*

- ○ 0
- ○ $-\frac{3}{2}$
- ◉ 1
- ○ $\frac{5}{2}$

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Question 9

The vectors $u = (-2,1,1)$, $v = (2,1,-1)$ *and* $w = (0,0,3)$ *span the vector space* $\mathbb{R}^3$.

- (selected) True
- False

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Question 10

If V is the set of all order pairs of real numbers with the following addition operation on $u=(u_1,u_2)$ *and* $v=(v_1,v_2)$:
$u+v=(u_1+v_1+1, u_2+v_2-2)$, *then the additive identity* (**0**) *is*:

- ○ $\mathbf{0}=(1,-2)$
- ◉ $\mathbf{0}=(-1,2)$
- ○ $\mathbf{0}=(-1,-2)$
- ○ $\mathbf{0}=(1,2)$

⚠ Click **Submit** to complete this assessment.

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⚠ Moving to the next question prevents changes to this answer.

Question 1

The vector $w = (0, \alpha, 2)$ *is a linear combination of* $u = (1, 0, -1)$ *and* $v = (1, -1, 0)$ *if:*

- ○ $\alpha = 1$
- ✗ ◉ $\alpha = -1$
- ○ $\alpha = 2$
- ✓ ○ $\alpha = -2$

⚠ Moving to the next question prevents changes to this answer.

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Question 2

If $u = (4,0,2)$ *and* $v = (3,0,4)$ *then the distance between* $-v$ *and* $u - v$ *is*

- $\sqrt{20}$
- $\sqrt{200}$
- $\sqrt{156}$
- $\sqrt{25}$

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Question 8

If $\|u\| = \|v\|$ *and* $\|u+v\|^2 + (u-2v)\cdot(v) = 3$, *then* $u \cdot v$ *equals*

× (selected) 0

✓ 1

$-\frac{3}{2}$

$\frac{5}{2}$

Moving to the next question prevents changes to this answer.

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Question 7

1 points Saved

If $a \ge 0$ *and* $\|u\|^2 = 11$, *then the value of a and b that makes* $u = (1, a, -1, 0)$ *and* $v = (-2, -1, b, -5)$ *orthogonal are*

- ○ $a = -2, b = 4$
- ◉ $a = 3, b = -5$
- ○ $a = 2, b = -4$
- ○ $a = 0, b = -2$

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The angle θ between $u = (1,0,1)$ and $v = (0,0,2)$ satisfies

- [x] $\cos(\theta) = \frac{\sqrt{2}}{2}$
- [ ] $\cos(\theta) = -1$
- [ ] $\cos(\theta) = 1$
- [ ] $\cos(\theta) = 0$

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If $u = (1,0,-2)$ *and* $v = (2,1,-2)$ *then the distance between* $2v + u$ *and* $3u$ *is*

- ○ $\sqrt{16}$
- ○ $\sqrt{26}$
- ◉ $2\sqrt{2}$
- ○ $2\sqrt{5}$

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Question 4

1 points

Which of the following is a subspace of $\mathbb{R}^2$

- [ ] $W=\{(x,y)\in\mathbb{R}^2 : x+y=2\}$
- [x] $W=\{(x,y)\in\mathbb{R}^2 : y=3x\}$
- [ ] $W=\{(x,y)\in\mathbb{R}^2 : x\geq 0, y\geq 0\}$
- [ ] $W=\{(x,y)\in\mathbb{R}^2 : x\leq 0, y\leq 0\}$

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Question 3

1 points Saved

The vector $w = (0, \alpha, -2)$ *is a linear combination of* $u = (1, 0, -1)$ *and* $v = (2, -1, 0)$ *if:*

- ○ $\alpha = 2$
- ○ $\alpha = 1$
- ◉ $\alpha = -2$
- ○ $\alpha = -1$

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Question 2

1 points Save Answer

If V is the vector space of real valued functions defined on $\mathbb{R}^+$ *with* $f(x) > 0$ *for all* x, *with the operations:*

$(f+g)(x) = f(x)g(x), \qquad (kf)(x) = [f(x)]^k.$

Then the negative (additive inverse) $-f$ *of the function* $f(x) = \frac{1}{x^2}$ *is:*

Hint: [the additive identity (zero vector) is the constant function $1(x) = 1$].

- ○ $-f(x) = x^2$
- ● $f(x) = x^{-2}$
- ○ $-f(x) = -\frac{1}{x^2}$
- ○ $-f(x) = 2^x$

Moving to the next question prevents changes to this answer.

Question 2 of 10

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Question 2

1 points

If V is the vector space of real valued functions defined on $\mathbb{R}^+$ *with* $f(x) > 0$ *for all* x*, with the operations:*

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- ○ $-f(x) = 2^x$

Moving to the next question ...

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Question 1

If $u = (-3,2,1)$ *and* $v = (2,1,0)$ *then the vector* $3u + v$ *equals*

- ○ $(2,6,4)$
- ◉ $(-7,7,3)$
- ○ $(-4,6,3)$
- ○ $(7,7,3)$

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